Working Capital Management and Corporate Governance: A New Pathway for Assessing Firm Performance in Developed Markets

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Today's corporate world faces dynamic challenges, based on various factors, including working capital management and corporate governance. These factors are challenging, especially in the aftermath of the 2008 global financial crisis (2008 GFC). Working capital management is considered to be one of the most important features of corporate management and deals with short-term management of investment and financing decisions. Working capital management aims to achieve the firm's financial objectives with efficient management of working capital components. However, to achieve these objectives, firms need to have systematic frameworks in place, with efficient monitoring devices and policies. This systematic framework is known as corporate governance, which is designed to ensure the transparency and accountability of those who are part of the firm's policy implementation group, so as to achieve better firm performance.

Prior studies have investigated the working capital management–firm performance and corporate governance–firm performance relationship separately. No attempt has been made to investigate the collective effect of working capital management and corporate governance on firm performance in a single study. This study aims not only to fill this gap but also to empirically support the theoretical basis that WC and CG both are important for getting full picture of firm performance. It investigates the individual impact of working capital

management and corporate governance on firm performance, as well as the collective effect of working capital management and corporate governance on firm performance. It examines six developed markets over the period of 2007-2016. This research also explores the relationship between working capital management–firm performance and corporate governance–firm performance, during the 2008 GFC.

Prior studies on working capital management, corporate governance and firm performance are typically measured using a static approach, which ignores the possibility of endogeneity. In addition to Ordinary Least Squares (OLS) and Fixed-Effects (FE), this research uses the System Generalised Method of Moments (GMM) to address the potential endogeneity problem.

The findings reveal that efficient management of working capital components and corporate governance determinants affect a firm performance. More specifically, the cash conversion cycle, average collection period, and inventory conversion period have negative relationship with firm performance whereas, average payment period reports a positive relationship with firm performance for all markets. The results also show that the number of independent directors has a negative relationship with firm performance. The average age of board members and executive compensation exhibit a positive relationship with firm performance. Audit committee meetings have an insignificant relationship with firm performance. Similarly, the collective effect of working capital management and corporate governance on firm performance complements the results produced by the working capital management–firm performance and corporate governance–firm performance relationships. The main results are also consistent with other performance indicators for robustness tests.

Key Words: working capital management, corporate governance, endogeneity, firm performance, developed markets

Dedication

This thesis is dedicated to Almighty Allah, my parents, my siblings and all those who have encouraged and motivated me to complete a PhD.

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Abbreviations

Abbreviation	Definition
AP	Accounts Payable
APT	Accounts Payable Turnover
AR	Accounts Receivable
ART	Accounts Receivable Turnover
AC	Audit Committee
ACM	Audit Committee Meetings
ACP	Average Collection Period
APP	Average Payment Period
BC	Board Compensation
BA	Board Age
BAA	Board Average Age
CCC	Cash Conversion Cycle
CG	Corporate Governance
CA	Current Assets
CL	Current Liabilities
CR	Current Ratio
EC	Executive Compensation
FS	Firm Size
FP	Firm Performance
ICP	Inventory Conversion Period
NWC	Net Working Capital
NACM	Number of Audit Committee Meetings
NID	Number of Independent Directors
ROA	Return on Assets
ROE	Return on Equity
SG	Sales Growth
TQ	Tobin's Q
WC	Working Capital
WCM	Working Capital Management

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Chapter 1
Introduction

1.1 Introduction

Increasing levels of internationalisation and globalisation present many challenges for firms, including firm performance (FP). Effective working capital management (WCM) is considered to be the best way to achieve FP (Deloof, 2003). Firms aim to achieve financial objectives with efficient management of working capital (WC) components. In order to achieve these objectives, firms must have a systematic framework for monitoring. This systematic framework is known as corporate governance (CG). Its objective is to ensure the transparency and accountability of all those individuals who are part of policy formulation and the implementation of it. Thus, in addition to efficient WCM, firms also need to implement good CG practices to achieve better FP. As WCM and CG both effect FP, inefficient WCM and weak CG result in negative FP (Gill & Shah, 2012; Tsagem, Aripin, & Ishak, 2014). Furthermore, weak CG may affect components of WCM (Mansi, 2008).

As Ben-Caleb (2009) found, in the past, a large number of business failures occurred due to financial managers' inability to cope with planning and controlling WCM components and/or due to poor policy formulation. The Board of Directors (BOD) and chief executive officers (CEO) are largely responsible for formulating these policies. These parties (BOD and CEO) are regarded as key parameters in assessing and implementing CG practices (Moyer, McGuigan, Rao, & Kretlow, 2009) and in making decisions related to WCM (Gill & Biger, 2013).

An important area of financial management, WCM plays a vital role in affecting FP (Talonpoika, Kärri, Pirttilä, & Monto, 2016). According to Sagner (2014) efficient management of WC is critical for the financial health of firms. Efficient WCM is important not only during times of financial crises, but it also helps increase FP by handling WC strategically (Deloof, 2003). In order to meet WC requirements, firms generally depend on banks and other financial institutions to secure sufficient funds in order to operate smoothly, especially during periods of financial turmoil.

However, a number of conventional banks failed or received bailout packages from governments in the US, Europe, the UK and other parts of the world, during the 2008 global financial crisis (hereafter 2008 GFC) (Elasrag, 2015; Hassan, 2009). In fact, their survival was a major challenge for the banking sector. Thus it was impossible for conventional providers to

support the firms financially (Ghafour, 2008). As a result, the 2008 GFC forced many firms to cease operations due to insufficient cash flow (Sumedrea, 2013). The closure of numerous firms, led to an increased interested in the issue of WCM and CG, and its relationship with FP (Baños-Caballero, García-Teruel, & Martínez-Solano, 2014).

There are numerous factors which effect FP. These include demand and supply, relative costs, increases in the cost of capital, competition among rivals, high inflation rates, challenges in managing business finance, challenges related to accounting practices, lack of access to capital funds, a lack of community support, a fear of failure, taxation issues, record keeping and performance measurement. However, the most important is WCM, which typically stands at 30% to 40% of a firm's overall investment (Uchenna, Mary, & Okelue, 2012).

Imegi (2003) contends that WCM is one of the most important components of corporate management, which gives life and force to the economy. Competent planning, managing and controlling WC components ensure a successful business. Lamberson (1995) suggests that firms need to minimise their investments (usually tied up in current assets), so that an optimal level of current assets and current liabilities are accomplished. The firm's success or failure depends on the effective utilisation of WCM, as it is an important feature in making corporate strategies and policies. WCM provides guidance for business managers who make the financial decisions (Vahid, Mohsen, & Mohammadreza, 2012).

Improving WCM enables firms to weather periods of economic turmoil (Kolay, 1991; Reason, 2008). According to Lo (2005), effective WCM is also important for firms during economic booms. Not only is WCM crucial for insulating firms against financial crises, but it is also linked to improved FP and competitiveness, which can be achieved by formulating policies related to cash and inventory management, accounts and payable management, along with other firm policies (Filbeck & Krueger, 2005; Gill & Biger, 2013).

WCM includes maintaining optimum levels of WC components such as cash, receivables, payables and inventory (Ganesan, 2007). Whereas, CG includes implementation of the best governance practices. In order to maintain the liquidity position and to foster FP, the optimum level of WC and best CG practices needs to be maintained, to ensure smooth business operations (Chandra, 2011; Roy, 2016). In addition to WCM, firms need to have good CG practices (Tsagem et al., 2014) to achieve FP. Inefficient WCM and weak CG results in negative FP (Gill & Shah, 2012; Tsagem et al., 2014). WCM affects short term FP (Harris, 2005; Talonpoika et al., 2016), whereas CG affects long term FP (Appel, Gormley, & Keim, 2016;

Bhagat & Black, 2001). Furthermore, weak CG may have negative results on cash management, including components of WCM (Mansi, 2008). Gill and Biger (2013) also highlight the importance of CG and effective utilisation of WCM, which in turn impact FP.

1.2 Reseach Problem

In terms of FP, a firm's chief executives are usually only interested in achieving short-term FP, rather than long-term FP. But nowadays, investors are interested in long-term performance. Although short-term performance enables a firm to avoid bankruptcy, measuring long-term performance is also important as it provides a picture of overall FP (O'Regan & Ghobadian, 2004). It has been argued that WCM affects short term FP (Harris, 2005; Talonpoika et al., 2016), while CG effects long term FP (Bhagat & Black, 2001; Sila, Gonzalez, & Hagendorff, 2016). The individual studies have reported that both WCM and CG on an individual basis effect FP. Why then has the existing literature ignored the collective effect of WCM and CG on FP, which is important for measuring both the short-and long-term impacts on firm performance? To the best of the researcher's knowledge, no empirical study has investigated the collective impact of WCM and CG on FP, for developed markets. This research sheds light on the collective impact of WCM and CG on FP [(WCM+CG)–FP], as well as the individual relationships between both WCM–FP and CG–FP. This research provides new knowledge on the collective effect (in a dynamic framework) which has been ignored in previous studies.

Most existing studies have been conducted for a specific sector, industry, and/or country (Durnev & Kim, 2005) and typically use small sample sizes or only cover a short time period. In order to avoid such limitations, this research considers all of the listed firms from six developed[1] markets on the basis of the MSCI[2] classification. The research thus provides consistent results from large data sets for a longer time period (10 years) (see section 3.5). This enables a comparison of results from across these six markets. The research also identifies differences among these six developed markets, while implementing WCM and CG practices.

WCM and CG have gained much attention in recent years; particularly after a series of high-profile corporate scandals (such as Adelphia, Enron, and WorldCom) and even more so, after

[1] According to the MSCI, developed markets are those which have high stability for economic development over the last three (consecutive) years.

[2] The list of countries is available on https://www.msci.com/market-classification.

the 2008 GFC. As a result, this research also examines the role of WCM and CG during the 2008 GFC. Furthermore, this research addresses the endogeneity problem in both the WCM–FP and CG–FP relationship by studying two way[3] relationships, which have been largely ignored by previous studies (see Chapter 5).

1.3 Contribution of Research

Even though there has been an increased academic interest in WCM and CG, in relation to FP, however, this has not been extended to the collective effect of WCM and CG on FP. Also, prior studies on WCM and CG have produced contradicting results. Prior studies on WCM, like those conducted by VU and Phan (2016) and Abuzayed (2012), report a significant positive relationship, whereas Deloof (2003) and Enqvist, Graham, and Nikkinen (2014)report a negative relationship. This is also true of studies which measure the impact of CG on FP. While Appel et al. (2016); Ducassy and Guyot (2017); Joh (2003) and Liu, Wei, and Xie (2014)all found a positive relationship, Gill and Mathur (2011); Gill and Shah (2012); Guo and Kga (2012); Khamis, Hamdan, and Elali (2015); Onakoya, Fasanya, and Ofoegbu (2014); Sila et al. (2016)and Schmidt and Fahlenbrach (2017) reported a negative one. These variations in results are due to limited sample sizes selected for the studies, as most of the prior studies have been limited to specific industries or countries (Black, 2001; Durnev & Kim, 2005; Klapper & Love, 2004). According to these authors, it is difficult to expand these studies due to their small samples and short time frames. This research therefore uses samples from six developed markets (see section 3.5 for selection criteria) to increase the empirical understanding of the individual roles of WCM-FP and CG-FP, along with the collective effect of WCM+CG-FP, for the period of 2007-2016.

Second, this research also analyses the empirical effects of WCM and CG on FP, during the 2008 GFC (see section 5.8). Although some scholars have examined the impact of WCM and CG during the 2008 GFC, most of these studies use qualitative methodology and lack empirical data (see Ramiah, Zhao, and Moosa (2014) and Scholleova (2012)for WCM and (Allen, 2005; Claessens & Yurtoglu, 2013) for CG. Furthermore, the existing literature reveals studies on the cumulative effects of WCM-FP relationship and the CG-FP relationship, during the 2008 GFC in a single study is non-existent.

[3] This mechanism is also known as endogeneity due to simultaneity.

Third, previous studies rely primarily on static measures, such as OLS or FE (see Chapter 4), to investigate the relationship between WCM-FP and CG-FP and have ignored the dynamic relationship. This research applies several statistical tests (such as dynamic OLS and Wooldridge strict exogeneity test) to test for endogeneity in the WCM-FP and CG-FP relationships. This research also applies dynamic panel data estimation to generate consistent and unbiased results (see Chapter 5). OLS and fixed-effect estimations were used for comparative purposes (see Chapter 4).

This research contributes to the pre-existing literature in several ways. First, this research extends the overall empirical WCM and CG literature that investigates their impact on FP (for example, Aktas, Croci, and Petmezas (2015); Sila et al. (2016)). Second, this is the first empirical research to examine the collective effect of WCM and CG on FP (WCM+CG-FP) in developed markets. In a broader context, this research contributes to the literature by documenting the collective relationship between WCM components and CG determinants.

Third, the existing studies have ignored the presence of endogeneity due to two main reasons; 1) simultaneity and 2) un-observed heterogeneity. This research expands pre-existing knowledge in terms of the collective effect of WCM and CG on FP (in a dynamic framework) not addressed in previous studies. Finally, this is the first research to empirically investigate the effect of both WCM and CG on FP on developed markets, during the 2008 GFC.

The research's findings will assist managers, practitioners, accountants, financial management consultants and policy makers to make competent financial decisions related to WCM. It will also assist managers who are the in process of formulating and implementing CG policies to achieve FP, especially in the context of financial crises.

1.4 Research Objectives

This research has four key research objectives;

1. To investigate whether the relationship between WCM-FP and CG-FP is dynamic in nature, in developed markets.
2. To measure and compare the individual impact of WCM-FP and CG-FP, in developed markets.
3. To measure the collective effect of WCM and CG on FP in developed markets.
4. To determine the impact of WCM-FP and CG-FP during the 2008 GFC, on developed markets.

1.5 Research Questions

As with the research objectives, this study has four key research questions;

1. Are the relationships between WCM-FP and CG-FP in developed markets dynamic in nature or otherwise?
2. How does the relationship between WCM-FP and CG-FP differ in developed markets?
3. What is the collective impact of WCM and CG on FP in developed markets?
4. How do WCM and CG effect FP during the 2008 GFC, in the developed markets?

1.6 Structure of Thesis

The remainder of the thesis is organised as follows. Chapter 2 discusses WCM and CG definitions, reviews the relevant literature on WCM and CG, including the WCM & CG theories, and prior studies on WCM and CG, focusing in particular on the 2008 GFC. Chapter 3 explains the study's methodology and outlines the theoretical framework. Chapter 4 reports and discusses the descriptive and empirical results obtained through OLS and fixed-effects estimation techniques. Chapter 5 presents the results obtained from dynamic panel data estimation. Chapter 6 summarises the study's findings, contributions, policy implications, limitations, and future directions for further research.

Chapter 2
Literature Review and Theories

2.1 Introduction

Having outlined the key concerns of this study in the previous chapter, this one develops a basic understanding of working capital management and corporate governance research and practices. Section 2.2 provides an overview of the literature related to WC and WCM definitions, WC policies, and WC components. Section 2.3 discusses the relationship between WCM and firm performance. Section 2.4 investigates the role of WCM during the 2008 GFC. Section 2.5 provides an overview of CG and CG theories. Section 2.6 examines the relationship between CG and firm performance. The final section explores the role of CG during the 2008 GFC. This chapter provides an overview of the existing literature related to WCM, CG and firm performance. Furthermore, it also helps to develop the conceptual framework as outlined in Chapter 3.

2.2 Definitions of WC and WCM

WC is considered to be the necessary amount of capital required for a firm to operate smoothly. It has been defined in a variety of ways, overtime. In the early 20th century, Mann (1918)defined WC as the "necessary money to perform existing firm operations" (p. 340). Similarly, the American Institute of Accountants (1947), published an Accounting Research Bulletin (ARB) where they defined WC as "an excessive availability of current assets in comparison to current liabilities" (p. 19). Gill, Biger, and Mathur (2010), along with Schaal and Haley (1991, page 166), define WCM as the "management of current assets and current liabilities, and financing these current assets." Tables 2.1 and 2.2 provide further definitions for the concepts of WC and WCM respectively.

Table 2.1 Definitions – Working Capital

Author's Name/s	Definitions
Besley and Brigham (2007)	It refers to a firm's investment in short term assets, such as cash, accounts receivables, accounts payable and inventories.
Brealey, Myers, Allen, and Mohanty (1997)	The difference between current assets and current liabilities.
Mead and Liedholm (1998)	It means current assets.
Pass and Pike (1984)	The difference between current assets and current liabilities.
Panda (2012)	A difference between current assets and current liabilities.
Samuelson (1989)	An interconnection between current assets and current liabilities.

Source: Author's own compilation

Table 2.2 Definitions – Working Capital Management

Author's Name/s	Definitions
Arnold (2008)	A tool used to create balance between WCM components.
Dong and Su (2010)	The financial management of an organisation that affects its performance and liquidity.
Mathuva (2009)	An optimum level to achieve a balance between liquidity and performance.
Preve and Sarria-Allende (2010)	The management decisions related to current assets and current liabilities.
Thachappilly (2009)	The management of the flow of funds.
Van Horne and Wachowicz (2004)	An optimum level between current assets and current liabilities.

Source: Author's own compilation

2.2.1 Working Capital Policies

The practices followed by firms while making WCM decisions are commonly known as WCM Practices. Through their WC investment policy, firms make investments and use current liabilities to finance their assets through WC financing policy (Chiou, Cheng, & Wu, 2006). Theoretically, a firm can either adopt an *aggressive working capital policy* or a *conservative working capital policy*, based on the strategy adopted by the investor (Narender, Menon, & Shwetha, 2008). The different policies affect the value, performance level and risk of firms. Firms decide to adopt either an aggressive or conservative WC policy (Afza & Nazir, 2007). According to Kaddumi and Ramadan (2012), firms tend to adopt a less aggressive WC policy and a conservative policy for investment. For an aggressive policy, a firm may opt for a lower level of current assets or may use a higher level of liabilities. Under an aggressive policy, if a

firm opts for a lower level of current assets, it may result in a negative performance; a lower level of current assets may generate issues of liquidity and inventory stock-outs (Baños-Caballero, García-Teruel, & Martínez-Solano, 2012). In short, it becomes difficult to obtain smooth business operations (Van Horne & Wachowicz, 2004).

Various researchers have noted that firms normally make their financial decisions based on more conservative WC policies(Juan García-Teruel and Martinez-Solano (2007);Mathuva (2015). In such situations, firms adopt higher current assets to decrease their risk. These firms expect lower returns because of the lower risk. Firms with higher risks and higher returns tend to have more aggressive policies (Gardner, Mills, & Pope, 1986; Weinraub & Visscher, 1998). WC practices and policies change significantly within industries and over time. Bratland and Hornbrinck (2013) and Weinraub and Visscher (1998) argue that there is no significant relationship between WC policies and returns trade-off.

2.2.2 Components of Working Capital

WCM is an important feature in making corporate strategies and policies. It informs manager's financial decisions, on a daily basis. According to Baños-Caballero, García-Teruel, and Martínez-Solano (2010), the most vital issue in managing WCM is the effective utilisation of its components. Similarly, Yadav (1986) argues that WCM is a situation in which the balance between current assets and current liabilities is maintained. Like various definitions and policies, the literature divides WCM into four main components; cash conversion cycle, accounts receivables, accounts payable and inventory (Brigham & Ehrhardt, 2013) as shown in Figure 2.1. Prior studies have considered the cash conversion cycle (CCC) as one of the measures for analysing FP (Baños-Caballero et al., 2012; Deloof, 2003; Wang, 2002). However, Yazdanfar and Öhman (2014) highlight the need to use the other three WCM components to analysing FP as well. These are discussed in the following section.

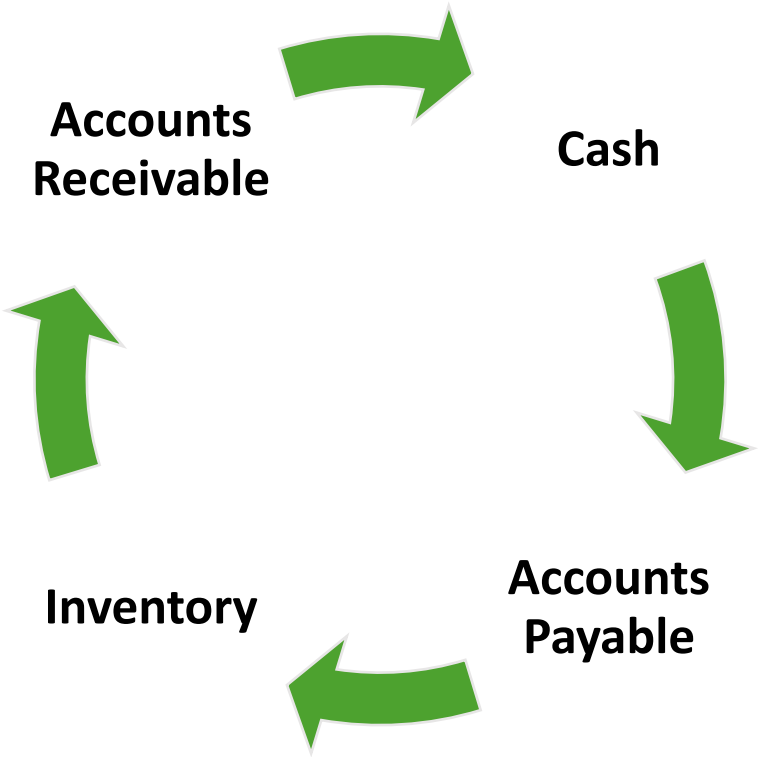

Figure 2.1 Components of Working Capital

2.2.2.1 The Cash Conversion Cycle (CCC)

Traditionally, efficient WCM was considered to be part of CCC. It focused on the principles of expediting receivables at the earliest possible time, while slowing down payment periods in order to improve FP (Nobanee, Abdullatif, & AlHajjar, 2011). CCC is recognised as an efficient tool to measure FP (Richards & Laughlin, 1980). Richards contends that CCC is crucial in achieving FP.

CCC is used as a comprehensive measurement of WCM and is defined as the sum of accounts receivables and inventory days, obtained after subtracting accounts payable days (AR+INV-AP). A weighted CCC was developed by Gentry, Vaidyanathan, and Lee (1990), according to which, time is scaled on the basis of the amount of funds in each step. Deloof (2003) explains CCC as the time lag between the firm's expenses on INV purchases and AR (discussed in detail in the next section), after the sale of the final product.

2.2.2.2 Accounts Receivable (AR)

The efficient management of AR is related to FP. The efficient management of AR is compulsory for the survival of firms, in order to maintain their performance and to address the liquidity issue (Biswal, Samantaray, & Sahoo, 2012). As García-Teruel and Martínez-Solano (2010) explain, AR affects the firm's level of investment, which in return, impacts

performance. As AR (trade credit) increases, sales turnover of firms increase, which ultimately leads towards a higher level of FP.

A trade credit policy is considered to be the best technique to enhance FP as it allows customers to analyse products before paying. Thus, the customer orders more, which in turn, increases sales (Deloof, 2003). However, according to Muhammad, Jan, and Ullah (2012), too much investment in AR may lead to negative performance, as other components such as AP and INV may not get the required attention. Hence, as Yazdanfar and Öhman (2014) argue, all WC components should be investigated when measuring FP. We examine the impact of accounts payable in the next section in order to assess how important it is in relation to FP.

2.2.2.3 Accounts Payable (AP)

AP is a major component of firm WC and plays a vital role in FP. According to Poutziouris, Michaeles, and Soufani (2005), trade credit is one of the most common, inexpensive and flexible sources of short-term funds and is primarily utilised by small businesses. However, availing cash discounts, on behalf of early payment, is much more valuable for a firm than late payments(Petersen & Rajan, 1997). Muhammad et al. (2012) document a negative relationship between AP days and FP. On the contrary, most prior studies report a positive relationship between AP and FP (Afeef, 2011; Mathuva, 2009; Nobanee & Alhajjar, 2009). However Gill et al. (2010)found no significant relationship between AP and FP.

2.2.2.4 Inventory (INV)

INV management is also a key factor which influences FP. Grablowsky (1984) acknowledges that FP can be increased by managing inventories in an efficient manner. Likewise, Koumanakos (2008) notes that efficient INV management leads to an increase in FP. Therefore, managers should work hard to create and maintain an optimal level of INV to achieve a balance between risks and returns(Juan García-Teruel & Martinez-Solano, 2007). The above studies signify the relationship between FP and IINV. Figure 2.2 displays the four components of WC systematically. The figure highlights how these components are interlinked with each other and how business operations run with the help of these components.

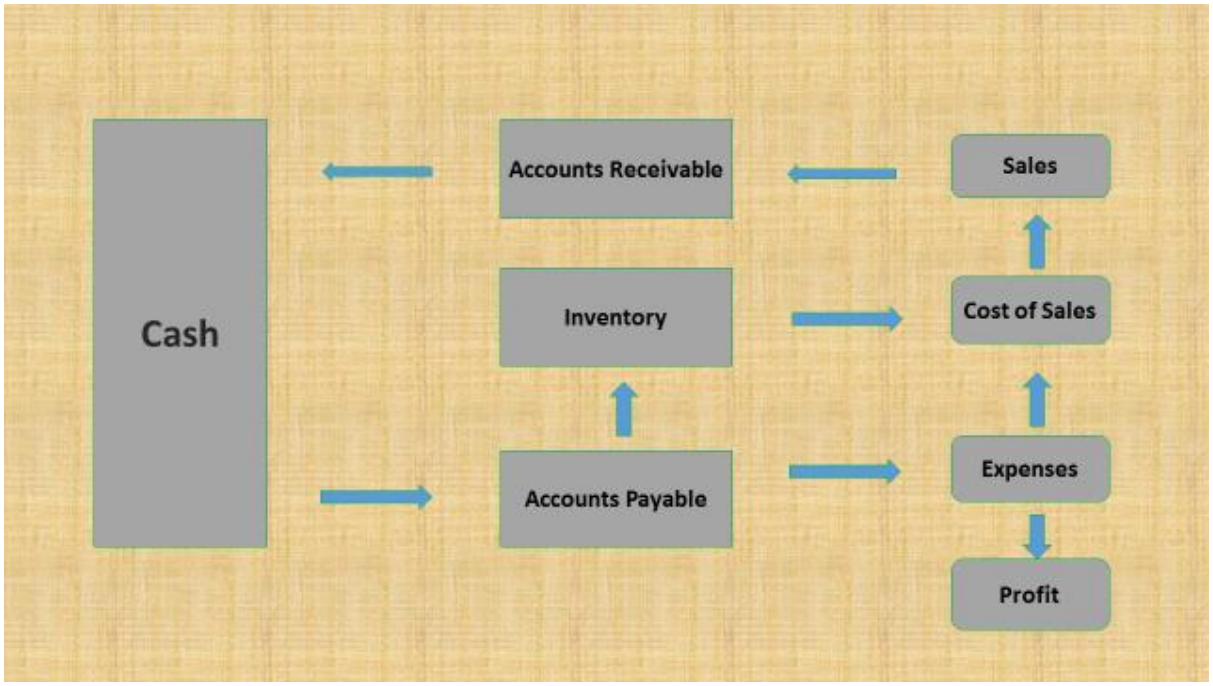

Figure 2.2 Working Mechanism of Working Capital Components

Source: Jordan, 2010, p.413

2.3 WCM and Firm Performance (FP)

Although the concept of WC originated in the mid twentieth with Swartz (1947)work (he floated the idea of business operating cycles), this term has only become popular in the last two decades or so. The concept of WC experienced various phases;

- the early phase (1900-1950s), where a number of disputes originated over the concept of WC;
- The economic development period (1950-1980s),this was an era of economic development and the business world witnessed a tremendous shift from the concept of WCM towards the simulation of various mathematical models for WC, such as the decision-making model, the interlocking model, and the control limit model and;
- The period of internationalisation and globalisation (1980s-2017s). In this era, researchers attempted to enhance awareness of WCM. Awareness of WCM in this era, shifted firm focus to the relationship between WCM and FP. This new awareness also resulted in increased academic attention, particularly after the 2008 GFC (Akoto, Awunyo-Vitor, & Angmor, 2013; Aktas et al., 2015).

Most of the prior studies have investigated the empirical relationship between WCM components (as discussed in section 2.2.2) and FP. The traditional concept of measuring the

impact of efficient WCM on FP is based on CCC. CCC is considered as one of the measures for analysing FP (Baños-Caballero et al., 2012; Deloof, 2003; Wang, 2002). However, Yazdanfar and Öhman (2014) highlight the need to use the other three components (AR, AP AND INV) of WCM to analyse FP.

In relation to CCC, mixed results have been reported in the literature. Several studies have found a negative relationship between CCC and FP (Deloof (2003); Enqvist et al. (2014); Gul et al. (2013); Johnson and Soenen (2003); Richards and Laughlin (1980); Sivashanmugam and Krishnakumar (2016). These results imply that reducing the CCC period would help to increase FP. Yet Chowdhury and Amin (2007); Gakure, Cheluget, Onyango, and Keraro (2012); and Kamran (2016)all reported a positive realtionship and Jahfer (2015)found that there was no negative relationship between CCC and FP.

Most businesses operate on credit terms; thus the collection of AR has a great impact on FP. Efficient AR management is crucial not only for firm survival, but it also helps to maintain firm performance by addressing the liquidity issue (Biswal et al., 2012). Mixed results have been found regarding the empirical relationship between AR and FP. While Ademola (2014);Chowdhury and Amin (2007); and Sharma and Kumar (2011a)all report a positive relationship, Akoto et al. (2013); Gakure et al. (2012); Gul et al. (2013); Hailu and Venkateswarlu (2016); Javid and Zita (2014); Lyroudi and Lazaridis (2000); Nobanee and Alhajjar (2009); Nguyen and Nguyen (2015); Samiloglu and Akgün (2016); and Sivashanmugam and Krishnakumar (2016) found the opposite to be true. However, Bratland and Hornbrinck (2013); Enqvist et al. (2014); and Nguyen, Tran, and Nguyen (2016) all report a non-significant relationship.

In comparison to AR (where firms need to recollect their credit sales), is accounts payables (AP) where firms need to repay their creditors. This is another important component for measuring FP, particularly in the context of WCM components. According to Poutziouris et al. (2005), trade credit is a common, inexpensive, flexible source of short-term funds. However, giving cash discounts for early payment is much more valuable for a firm than late payments(Petersen & Rajan, 1997). A significant negative relationship has been established between AP and FP in the studies (Ahmed, Awan, Safdar, Hasnain, and Kamran (2016); Chowdhury and Amin (2007); Deloof (2003); Gakure et al. (2012); Gul et al. (2013); Hailu and Venkateswarlu (2016); Javid and Iqbal (2007); Jahfer (2015); Mathuva (2015); Nguyen and Nguyen (2015); Padachi (2006). However, others report a positive relationship between AP

and FP (Ademola (2014); Afeef (2011); Akoto et al. (2013); Mathuva (2009); Nobanee et al. (2011); Temtime (2016).

Likewise, Koumanakos (2008) points out that efficient management of inventory leads to an increase in FP. In case of inventory, Ahmed et al. (2016); Gakure et al. (2012); Gul et al. (2013); Hailu and Venkateswarlu (2016); Javid and Zita (2014); and Nguyen and Nguyen (2015)all reported a negative relationship. On the contrary, Ademola (2014); Akoto et al. (2013); Chowdhury and Amin (2007); Sivashanmugam and Krishnakumar (2016); and Temtime (2016) reported positive relationships between inventory and FP.

Table 2 .3 displays the empirical relationship between WCM and FP reported by some of the prior studies, whereas Table 2.4 provides a summary of literature (not discussed earlier).

Table 2.3 WCM and Firm Performance – An Empirical Relationship

Previous Studies	CCC-FP	AR-FP	AP-FP	INV-FP
Deloof (2003)	_	_	+/_	_
Enqvist et al. (2014)	_	_	_	_
Gill et al. (2010)	+	_	+/_	+/_
Juan García-Teruel and Martinez-Solano (2007)	_	_	+/_	_
Karaduman, Akbas, Caliskan, and Durer (2011)	_	_	_	_
Lazaridis and Tryfonidis (2006b)	_	_	_	_
Mathuva (2009)	_	_	+	+
Nobanee and Alhajjar (2009)	_	_	+	_
Padachi (2006)	_	_	_	+/_
Sharma and Kumar (2011a)	+	+	_	_

Note: (+) sign indicates a positive relationship between WCM and performance, whereas a (-) sign indicates a negative relationship between WCM and performance. A +/- shows no significant relationship.

Source: Author's compilation.

Table 2.4 Working Capital Management - An Overview of Prior Studies

Previous Studies	Aim of Study	Key Findings
Ali and Ali (2012)	To see whether WCM impacts FP in Pakistan.	There is a positive impact of WCM on FP.
Arshad and Gondal (2013)	To investigate the impact of WCM on FP in the Pakistani cements industry.	There is a negative and significant relationship between WCM- FP.
Azam and Haider (2011)	To find the impact of WCM on Non- Financial Institutions operating in KSE-30 INDEX of Pakistan.	WCM has a negative significant impact on FP.
Bandara and Weerakoon (2011)	To examine relationship between WCM and FP for listed firms on the Colombo Stock exchange.	Significant negative relationship was established.
Danuletiu (2010)	To determine the impact of WCM on FP of Alba County companies.	Weak negative linear link between WCM indicators and performance rates.
Enqvist et al. (2014)	To measure the impact of WCM on FP in Finland.	WCM-FP relationship is more pronounced in economic downturns relative to economic booms.
Ghaziani, Biabani, and Zadeh (2012)	To investigate the relationship between components of WCM with Market Valuation and FP in Iran.	Significant negative associations between working capital variables and FP.
Hoang (2015)	To examine the impact of WCM on FP for listed manufacturing firms in Vietnam.	Significant negative relationships between CCC, ACP, APP, net trade cycle and ROA.
Majeed, Makki, Saleem, and Aziz (2013)	To empirically investigate the relationship between CCC and FP of Pakistani firms.	ACP, CCC, and inventory conversion period have a negative relationship with FP.
Mansoori and Muhammad (2012)	To investigate the impact of WCM on Singaporean FP.	CCC is negatively associated with the return on asset (ROA).
Manzoor (2013)	To measure the relationship between WCM and FP in the cement industry listed on KSE, Pakistan.	Significant negative relationship between AR and FP.
Mohamad and Saad (2010)	To investigate the impact of WCM on FP in Malaysia.	Significant negative associations between components of WCM- FP.
Mun and Jang (2015)	To measure the relationship between WC, cash holding, and profitability of restaurant firms.	Establish a strong inverted U-shape relationship between WCM and FP.
Napompech (2012)	To investigate the effects of WCM on the FP of Thai Listed Firms.	Negative relationship for inventory conversion period and the receivables collection period.

Table 2.4 Continued

Previous Studies	Aim of Study	Key Findings
Nimalathasan (2010)	To examine the relationship between WCM-FP for manufacturing companies in Sri Lanka.	FP can be increased by reducing the number of day's inventories and accounts receivable.
Ogundipe, Idowu, and Ogundipe (2012)	To examine the relationship between WCM-FP in Nigeria.	Significant negative relationship between CCC, market valuation, and FP.
Onwumere, Ibe, and Ugbam (2012)	To find the impact of WCM on FP of Nigerian firms.	There is a positive impact of both aggressive investment and financing WC policies on FP.
Quayyum (2011)	To examine the relationship between WCM-FP in the cement industry in Bangladesh.	A significant relationship between the performance indices and WCM.
Rahman (2011)	To examine the relationship between WCM-FP on Textile Industry operating in Pakistan.	WCM has a positive impact on FP.
Salehi (2012)	To examine the relationship between WC changes and fixed assets with assets return in Iranian Scenario.	A significant relationship between changes in working capital and fixed assets, with assets return.
Sutanto and Pribadi (2012)	To find the efficiency of WC on Company Profit Ability in Generating ROA (Case Studies in CV. Tools Box in Surabaya).	It indicates that only partially net working capital turnover has a significant effect on ROA.
Tufail and Khan (2013)	To examine impact of WCM on FP of Textile Sector in Pakistan.	The FP is negatively related to aggressive WC policies.
Usama (2012)	To investigate the relationship between WCM and FP for food sector listed on (KSE) Karachi stock exchange of Pakistan.	There is a positive and significant effect between the WCM- FP relationship and the liquidity of the firms.
Ukaegbu (2014)	To determine the level of significance of WCM on FP from developing economies in Africa.	Significant negative relationship between CCC and FP.
Uremandu, Ben-Caleb, and Enyi (2012)	To measure the relationship between WCM components, liquidity and corporate performance for Nigerian firms operating in produce sector.	The positive impact of INVT, ART and a negative effect of CCC, and APT on FP.
Vural, Sökmen, and Çetenak (2012)	To examine the empirical relationship between WCM and FP in Turkey.	FP can be increased by shortening ART, and CCC.

Source: Author's compilation

2.4 WCM and 2008 GFC

The 2008 GFC is considered as the biggest financial crisis event since the great depression of the 1930s. The 2008 GFC was caused by weak management practices and poor surveillance systems (Chapra, 2011; Grant & Wilson, 2013; Lin, Hu, & Tsai, 2012). During the 2008 GFC, various industrial countries of the world injected $3 trillion into private business, as bailout packages, to minimize the effects of the crisis. It is important to identify the primary cause of this crisis. In its annual report (published on June 30, 2008), the Bank for International Settlements (BIS), declared that liquidity crunch was the major factor in this crisis. The 2008 GFC has forced many firms to cease operations due to poor management of WCM (Sumedrea (2013). Banks were facing liquidity crises and were not in a position to provide financial support to firms to meet their daily operational expenses.

Various authors have attempted to examine the impact of WCM on FP and factors affecting WCM during the 2008 GFC. Indiastuti and Febrian (2015) reported that the impact of WCM and the adoption of WC policies varied during the 2008 GFC. Writing about Australia, Ramiah et al. (2014)found alterations in WCM practices (such as shortening capital expenditure, reducing inventory levels and behavioural biases of managers),during the 2008 GFC. Scholleova (2012) analysed the role of WCM during the 2008 GFC and reported that active management survived during the 2008 GFC by optimising assets. These firms focused on production, sales, and financing WC. Gunay and Kesimli (2011) reported that publicly listed firms have been, to some extent, negatively affected by the 2008 GFC.

Baveld (2012)investigated the WCM of Netherland's publicly listed firms before (2004-2006), and during (2007-2009), the 2008 GFC period. The study found that firms whose goal it was to increase profits during the crisis period did not change their WC policies and followed aggressive WC policies. VU and Phan (2016) analysed the impact of WCM on FP during 2008 to 2012, for 121 firms listed on the Vietnam stock exchange. They reported that WCM directly affects FP. During financial crises, managers should organise the earliest possible collection of AR in order to have ample cash for firm operations. The 2008 GFC has not only affected WC management, but has also contributed to a failure in CG practices. This failure ultimately led to systematic consequences (Allen, 2005; Claessens & Yurtoglu, 2013) and the subsequent need for CG practices which focus on increasing FP.

2.5 Corporate Governance

The importance of CG for achieving better FP, along with taking care of social welfare, cannot be undermined. CG holds a vital and dynamic position in all aspects of business (Dibra, 2016). The inefficient management of either WCM or CG will result in poor FP(Gill & Shah, 2012; Tsagem et al., 2014). Keeping in view the importance of both (WCM and CG) this research investigates the collective effect of WCM and CG on FP (see research objectives in section 1.4). Hence, it is necessary to review the CG literature review.

CG literature has gained immense academic and corporate attention after the collapse of several major firms across the world, such as Adelphia, Enron, Global crossing, Arthur Anderson, WorldCom (Lins, Servaes, & Tamayo, 2017). This section provides a broad definition of CG, considering both narrow and wider views (Solomon, 2010).In the case of the narrow view, Shleifer and Vishny (1997) define CG as "[…] the ways in which suppliers of finance to corporations assure themselves of getting a return on their investment" (p.123). Similarly, the Cadbury Committee defines CG "as the system by which companies are directed and controlled" (Cadbury, 1992). According to Doidge, Karolyi, and Stulz (2007) CG is defined as the customs, laws, policies, and procedures that affect the functioning of corporate firms, which in return effects FP.

The literature recommends that publicly listed firm should adopt specific internal governance structures (Weir, Laing, & McKnight, 2002). As this study considered publicly listed firms in developed markets, it also examines internal CG mechanism factors while investigating the relationship with FP. The same has been implemented in regards to CG, when e defining the conceptual framework of this research and selecting independent variables (see sections 3.3 and 3.4.2).This study did not examine external governance mechanisms. This limitation is discussed further in section 6.6.

Definitions of CG can be divided into two main groups. The first group deals with behavioural patterns of corporations, such as shareholders, stakeholders and financial growth. The studies for single countries or firms operating within that particular country normally choose the first group. Whereas, the second group is concerned with normative frameworks, such as firm operations, firm performance and data is based on legal, judicial and financial systems. On the basis of the normative group, cross country studies are conducted in order to allow for comparisons (Claessens & Yurtoglu, 2013). This study follows this approach.

Questions may arise over how to compare results across six selected markets, if the CG frameworks of these markets (see Table 3.2) are different? This issue was addressed while selecting the sample markets for this study ; the sample markets are signatories of the OECD CG framework and have a uniform set of CG practices (OECD, 2017). Hence, no problem arises while comparing the results across our sample markets due to uniform CG standards. Table 2.5 provides further definitions of CG reported by prior studies.

2.5.1 Corporate Governance Theories

According to Abu-Tapanjeh (2009), CG holds different meanings in an organisational context. Due to the failure of corporate firms in recent years, the corporate sector is now paying more attention to CG practices. To some extent, the CG literature has not captured the true concept hidden in this term. Ambiguity arises in words such as manage, govern, regulate and governance. Due to these ambiguities, various researchers have interpreted governance according to their own understandings. Hence, Abdullah and Valentine (2009)reviewed different basic theories emphasising CG, using agency theory, expanded into stewardship and stakeholder theory. Each of these theories is briefly discussed.

2.5.1.1 Agency Theory

Alchian and Demsetz (1972) provide a comprehensive description and explanation of agency theory, which was originated from economic theory and was further developed by Jensen and Meckling (1976). It is defined as the "relationship between the principals, such as shareholders and agents such as the company executives and managers" (p.366). In agency theory, shareholders are empowered to perform the work as an owner or principal. According to Clarke (2004), principals or owners delegate business matters to managers or directors to ensure the smooth functioning of the organisation. There are two crucial factors to consider in relation to agency theory (Daily, Dalton, & Cannella, 2003). Firstly, it reduces the corporation to two participants (managers and shareholders). Secondly, it foregrounds the self-interested relationship of employees or managers in an organisation.

The basic objective of agents acting on behalf of shareholders is to make decisions in favour of the principal interest. However, agents do not always make decisions that reflect principals' best interests (Vives, 2000). Adam Smith first identified this in the 18th century. His theory was later confirmed by Ross (1973). In fact, Davis, Schoorman, and Donaldson (1997) also highlight problems arising due to a separation of ownership in agency theory. Bhimani,

Horngren, and Foster (2008) explains that agency theory was introduced as a result of the separation between ownership and control in firms.

Figure 2.3 explains the relationship and role of each component in an agency theory setting. The figure explains that the principals (as owners of the firms), hire and delegate power to agents to act on their behalf. In ideal conditions, agents must make decisions in favour of the owners, but at the same time, they also consider their own interests.

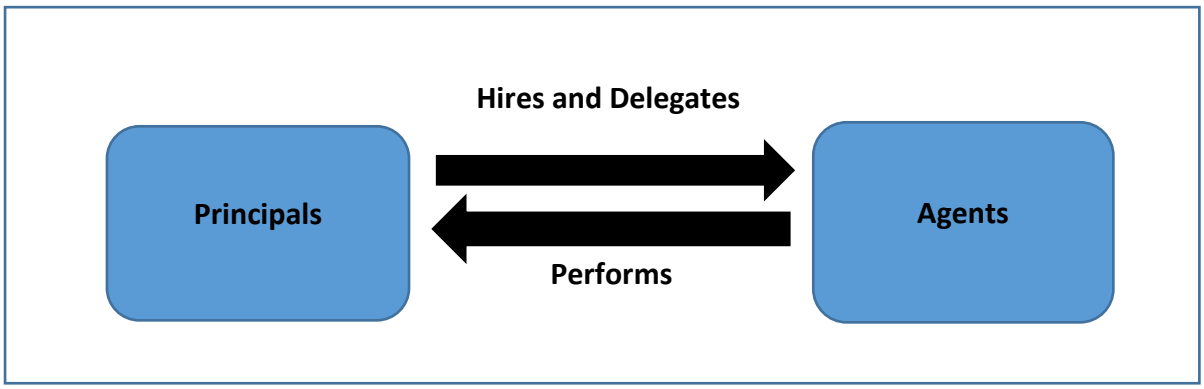

Figure 2.3 Agency Model

Source: Author's Illustration Based on Jensen and Meckling's (1976) Agency Theory

2.5.1.2 Stewardship Theory

Stewardship theory originates in sociology and psychology. Davis et al. (1997) explain that "a steward protects and maximises shareholder's wealth through FP because by so doing, the steward's utility functions are maximised" (p.217). Based on this definition, firm executives or managers are stewards working to maximise profit for shareholders. In contrast to agency theory, stewardship theory focuses on individualism and the role of top management as stewards (Donaldson & Davis, 1991).

According to Donaldson and Davis (1991), stewardship theory acknowledges the importance of structures that enable stewards to offer possible autonomy built on trust. It focuses on employees or executive positions so that they can work independently and in return, can maximise shareholders profit. However, Argyris (1973) argues that agency theory considers employees as economic beings, which ignores individuals' own ambitions or goals. Hence, the autonomy given by stewardship theory minimises processes designed to monitor and control costs (Davis et al., 1997).

Empirical studies have also found that returns could be improved by combining both theories rather than using them in isolation (Donaldson & Davis, 1991). Figure 2.4 explains that shareholders empower and trust stewards (company executives or managers) for the maximisation of shareholders profits. In comparison to agency theory, stewardship theory acknowledges that stewards are humans who need intrinsic and extrinsic motivations along with self-autonomy to make decisions for maximum shareholder profit.

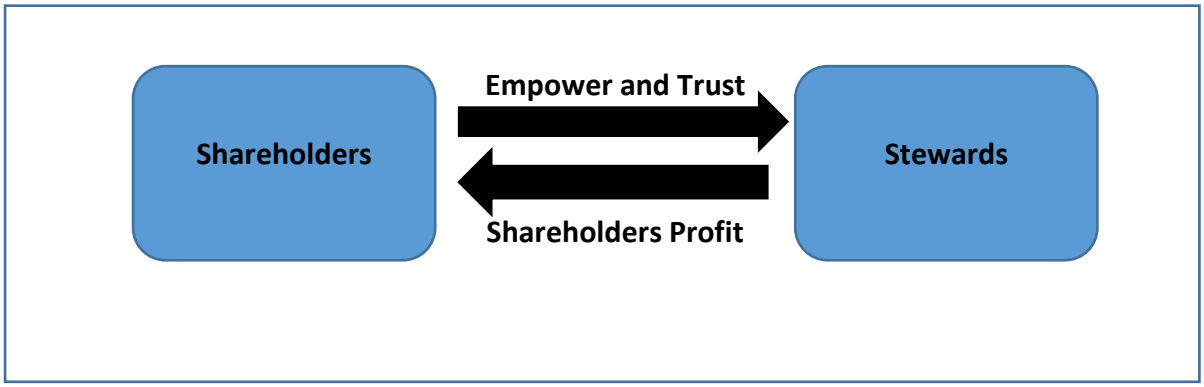

Figure 2.4 Stewardship Model

Source: Author's Illustration based on Davis, Schoorman& Donaldson's (1997) Stewardship Theory

2.5.1.3 Stakeholder Theory

Stakeholder theory originated in 1970 in management studies. Freeman (1984) developed the theory by integrating corporate accountability to a broad range of stakeholders. However, Wheeler, Fabig, and Boele (2002)argue that it originated from within both organisational and sociological fields. Indeed, stakeholder theory is less of a formal unified theory and more of a broad research tradition, incorporating philosophy, ethics, political theory, economics, law and organisational science.

According to Freeman (1984), stakeholder theory is defined as "any group or individual who can affect or is affected by the achievement of the organisation's objectives" (p. 46). Stakeholder theorists suggest that managers should have strong networking skills (with employees, suppliers and business owners). According to Harrison and Freeman (1999), to achieve organisation goals, a strong networking relationship is much more important than an employee-manager-owner relationship (preferred in agency theory).

Figure 2.5, explains the reciprocal relationship between firms and their stakeholders in light of stakeholder theory. According to stakeholder theory, managers have relationships with these different stakeholders to achieve their ultimate purpose, that is, the firm's objectives.

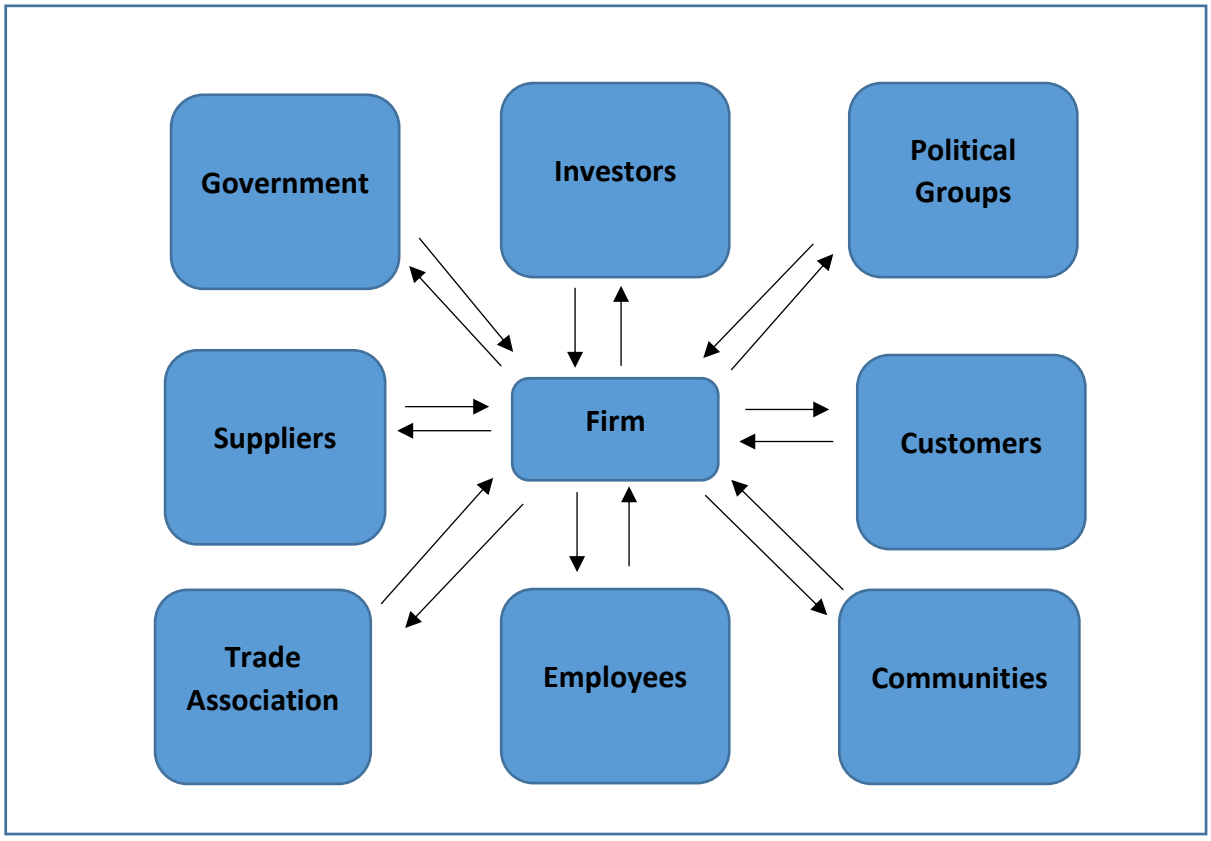

Figure 2.5 Stakeholder Model

Source: Author's Illustration based on Donaldson and Preston's (1995) Stakeholder Theory

2.6 Corporate Governance and Firm Performance

In light of our objective 2, section 2.3 discusses the relationship between WCM and FP and this section discusses the relationship between CG and FP in light of objective 3. CG's primary goal is to maximise shareholders; wealth by managing the firm's operations. The literature reveals that there is a basic conflict between shareholder's and management's interests (Jensen & Meckling, 1976). In the case of non-uniform information, managers might use resources for their own benefit by devising particular strategies or investing in specific projects, rather than increasing the firm's value. According to Denis and McConnell (2003), effective CG would lead to the maximisation of shareholder's wealth. They argue that this can be achieved by utilising suitable resources, by providing access to capital and improving investor confidence. This is linked with external market conditions and internal organisational decisions. Firms' reactions to external conditions depend greatly on the management of the firm as well as the effectiveness of the governance structure (Gregory & Simms, 1999).

Furthermore, Rwegasira (2000) argue effective CG avoids exploitation of firm resources and results in better FP.

Weisbach (1988) investigates the impact of CG determinants over FP of listed S&P 500 Index. The study reported that firms which have a higher number of independent directors are likely to replace the CEO in the case of poor firm performance. Similarly, independent directors may join the firm's board due to poor performance, or may leave the board according to the firm's specific requirements (Hermalin & Weisbach, 1988). Some prior studies have documented a positive relationship between board composition and firm performance. Lee, Rosenstein, Rangan, and Davidson III (1992) and Rosenstein and Wyatt (1990) conducted a study for firms listed on New York and American Stock exchanges to analyse the impact of CG on FP. Both of these studies reported that firms with independent directors are significantly linked with higher abnormal returns to the firms. Some others have reported that a greater number of independent directors on the board leads to higher FP (Barnhart, Marr, & Rosenstein, 1994; Daily & Dalton, 1992; Schellenger, Wood, & Tashakori, 1989). Pfeffer (1972)studied 80 firms selected from the Dun and Bradstreet Reference Book of Corporate Management and reported that the proportion of internal director resulted in declining FP. whereas, in the case of better FP, independent directors were added to the board. According to Baysinger and Butler (1985) boards which have a higher proportion of independent directors have an above average performance in comparison to those with a lower number of independent directors. On the other hand, prior studies have found a negative relationship between FP and independent directors for US publicly listed companies(Bhagat & Black, 1999). Weir and Laing (2001)provide a variety of possible reasons for the negative relationship between independent directors and FP; independent directors are only hired part time, they have other assignments which may demand their time and attention and they also have a lack of understanding with the firm's internal directors.

The most important and crucial CG processes and decisions are generated from board composition, such as audit committees, remuneration, and nomination committees (Berezinets, Ilina, & Cherkasskaya, 2017; Safari, 2017). These committees allow the board to handle the sensitivity of information that needs to be addressed(Olsen & Tamm, 2017). It has been argued that CG systems which encourage accountability and transparency exhibits significant relationships with voluntary disclosures (Huafang & Jianguo, 2007). The effect of board composition on disclosures is measured by the percentage of independent directors

and is positively related to mandatory disclosures (Chen & Jaggi, 2001) and increases in the proportion of the number of independent directors improves voluntary disclosures (Donnelly & Mulcahy, 2008; Huafang & Jianguo, 2007).

Studies have found that CG affects FP due to reduced exploitation by insiders and development in cash flows that can be disseminated among investors (Black, Jang, & Kim, 2006; Claessens, Djankov, Fan, & Lang, 2002; Gompers, Ishii, & Metrick, 2003; Klapper & Love, 2004). Various proxies (see section 3.4.1) for measuring the relationship between CG and FP have been used by different authors. These typically fall under accounting and market-based measures (Appel et al., 2016; Kiel & Nicholson, 2003). Additional studies, which investigate the impact of CG on FP at different points of time in various markets, sectors and industries, not reported above, are summarised in Table 2.6.

Table 2.5 Prior Studies – Corporate Governance Determinants

Previous Studies	Aim of Study	Key Findings
Ararat and Dallas (2011)	To measure the impact of CG on FP in emerging markets.	No significant relationship between CG and FP.
Black and Kim (2007)	To measure the value of board independence in an emerging markets by considering empirical evidence from Korea.	External directors have a significant relationship on FP, whereas audit committee has a negative relationship on FP.
Black and Khanna (2007)	To find whether CG reforms can increase FP in India.	There is a statistically significant relationship between CG and FP
Black, De Carvalho, and Gorga (2012)	To study the relationship between CG and FP in emerging markets.	Better CG practices would lead to positive FP.
Caprio and Levine (2002)	An overview of the role of CG on FP - analysing the general concepts and international observations.	CG influences the efficiency of firm production at the corporate level.
Choi, Park, and Yoo (2007)	To find the impact of outside directors on FP in Korea.	External directors have a significant positive relationship on FP.
Claessens et al. (2002)	To measure the impact of incentive and entrenchment effects of shareholders on FP.	The largest value of owners' equity stake will lead towards higher firm value.
Fooladi and Nikzad Chaleshtori (2011)	To measure the relationship between CG and FP.	No significant relationship between CG (board independence, ownership, and board size) and FP. Whereas, CEO duality has a negative effect on FP.
Francis, Hasan, and Wu (2015)	To find the impact of directors belonging from academia as a determinant of CG on FP.	Firms with directors from academia have better FP.
Javid and Iqbal (2007)	To measure the relationship between CG indicators and FP in a case of the Karachi Stock Exchange.	Positive but weak significant relationship between CG and FP.
Joseph, Ocasio, and McDonnell (2014)	To determine the impact of CG determinants (executive power, institutional logics, and the adoption of CEO-only board structures) on FP in the United States.	Positive relationship between board independence and FP.

Table 2.5 Continued

Previous Studies	Aim of Study	Key Findings
Kim, Kim, and Lee (2008)	To examine the relationship between ownership structure and the relationship between financial slack and R&D investments for Korean Firms.	Positive relationship between institutional ownership and FP.
Lauterbach and Tolkowsky (2007)	To examine the relationship between CG and FP, while also evaluating the market-value-maximising ownership structure.	No significant relationship between CG and FP.
Lo, Wong, and Firth (2010)	To determine the impact of CG on manipulating earnings, by considering sales transactions in China.	Negative significant relationship between the board of directors and FP.
McCahery, Sautner, and Starks (2016)	To discuss CG as the basic preference of institutional investors while making an investment.	Positive relationship of CG on FP.
Schmidt and Fahlenbrach (2017)	To examine the relationship between passive institutional ownership and FP.	Negative relationship between institutional ownership and FP.
Sheng, Zhou, and Li (2011)	To examine the effects of CG determinants (business and political ties) on FP in China.	Cumulative voting in an election of directors would result in better FP.
Song and Lei (2008)	To measure the impact of CG (family ownership, and firm valuations) in Hong Kong.	Firms with good CG practices exhibit better FP.
Velnampy (2013)	To measure the relationship between CG and FP for Sri Lankan Manufacturing Companies.	No significant relationship between CG and FP.
Yasser, Entebang, and Mansor (2015)	To measure the relationship between CG and FP of Karachi Stock Exchange (KSE)-30, Pakistan.	CG (board size, board composition, and audit committee) and FP have a positive significant relationship.
Yeh, Lee, and Woidtke (2001)	To measure the relationship between family control and corporate governance in Taiwan.	Negative relationship between CG determinants and FP.
Yurtoglu (2000)	To measure the relationship between CG determinants (ownership and control) and FP of Turkish listed firms.	Negative relationship between CG determinants and FP.

Source: Author's compilation

2.7 Corporate Governance and the 2008 Financial Crisis

A decade ago CG held little interest for academics, and was rarely discussed in corporate meetings. Several unfortunate events, including the financial crisis of 1998 in Russia, Asia, and Brazil, which affected entire economies and global financial systems, changed this. Just a few years after the1998 crisis, corporate scandals in the United States and Europe led to the greatest number of bankruptcy in recent history.

The recent 2008 GFC is considered to be the most serious financial crisis since the Great Depression of the 1930s (Blundell-Wignall, Atkinson, & Lee, 2008; Cheffins, 2009; Jagtiani & Lang, 2010; Kirkpatrick, 2009). Scholars reviewing the causes of the 2008 GFC have argued that poor CG was a key contributing factor (Lang and Jagtiani (2010); Laeven and Valencia (2010); Tarraf (2010);Yeoh (2010). Other factors such as macroeconomic conditions, weak regulatory check-up, a lack of transparency and accountability played only supplementary roles (Anwar, 2009; Fetisov, 2009; Kirkpatrick, 2009; Lins et al., 2017; Möslein, 2009; Poole, 2010; Yeo, 2009).

Chapter 3
Research Methodology

3.1 Introduction

Having discussed the existing literature in Chapter 2, this chapter provides a comprehensive outline of the study's research methodology. This study's research methodology is based on research objectives and research questions outlined in sections 1.4 and 1.5. The chapter is organised as follows: Section two examines the debates around quantitative and qualitative models of research and the study's chosen model. While section three discusses the study's conceptual framework, section four defines the variables and their measurements. Section five discusses the sample and data. Section six provides an overview of prior methodologies used while investigating the impact of WCM and CG on firm performance. While section seven outlines the regression models used in the study, section eight summarises the chapter's key points.

3.2 Nature of Existing Studies (Models)

Several models can be used to measure FP. Edvinsson and Malone (1997) categorise these models into two main classes: qualitative and quantitative measures. As Luft and Shields (2010) note, these models have different purposes in firm decision making. While quantitative models are useful for making financial decisions, qualitative models are helpful when firms need to make social decisions. Non-monetary models are qualitative in nature, with limited benchmarking and provide restricted information because of the firms' specific characteristics (Sydler, Haefliger, & Pruksa, 2014). Quantitative–based models help to compare and measure the results across the countries, industries, and firms. Furthermore, quantitative models extract information from secondary sources which are typically audited and therefore, increase the reliability of the results.

While Orobia, Byabashaija, Munene, Sejjaaka, and Musinguzi (2013)and Ramiah et al. (2014)conducted a qualitative study to determine the impact of WCM and CG on FP, there are numerous studies that have used quantitative methods to quantify the relationship between WCM-CG and FP (Aktas et al., 2015; Appel et al., 2016; Shehata, Salhin, & El-Helaly, 2017). This study uses a quantitative based approach, due to the benefits identified to

investigate the impact of WCM and CG on FP in developed markets. The next section outlines the study's conceptual framework.

3.3 Conceptual Framework

Prior empirical studies have investigated the impact of WCM components on FP in different markets. Previous studies have used the components of WC: the cash conversion cycle (CCC), the average collection period (ACP), the average payment period (APP), and the inventory conversion period (ICP) to measure the impact on FP (Filbeck & Krueger, 2005; Juan García-Teruel & Martinez-Solano, 2007; Lazaridis & Tryfonidis, 2006a; Nazir & Afza, 2009; Tsagem et al., 2014). To investigate the relationship between CG and FP, the internal and external determinants need to be considered simultaneously (see section 2.4 for details).In this context prior studies have used an array of variables such as ownership structure, conflict of interest among stakeholders, board composition, board gender, CEO duality, board age range, audit committee size, number of independent directors on board, cultural implications, and incentive compensations (Bansal & Sharma, 2016; Black & Khanna, 2007; Khan, Muttakin, & Siddiqui, 2013; McCahery et al., 2016). This study only examines internal CG mechanisms due to following reasons; 1) the literature recommends considering internal mechanism while investigating the FP relationship; 2) the non-availability of data related to external factors in our selected database; and 3) WCM decisions are linked to internal decisions and firm policies. These decisions are made by internal CG factors, such as board independence and board structure. This study therefore focuses on internal CG mechanisms along with WCM components, while selecting independent variables.

This study (see sections 1.4 and 1.5) seeks to determine the relationship between WCM and CG on FP on both an individual and on collective basis with FP. It is, therefore, interested in the independent variables; WCM components (cash conversion cycle, average collection period, average payment period, and inventory conversion period) and CG determinants (number of audit committee meetings, the number of independent directors, board average age and executive compensation) and their impact on FP. To measure FP, ROA, ROE, and Tobin's Q have been used as dependent variables (Aktas et al., 2015; Appel et al., 2016; Shehata et al., 2017).

Furthermore, various control variables, such as firm size, sales growth, and liquidity ratio, which are known to affect FP are controlled, as in case of omitting these variables, the

concerns about missing factors correlated with the main independent variable would raise (Adjaoud, Zeghal, & Andaleeb, 2007; Aktas et al., 2015; Boone, Field, Karpoff, & Raheja, 2007; Damodaran, 2012; Gill & Biger, 2013; Hill, Kelly, & Highfield, 2010).

Figure 3.1 outlines this study's conceptual framework. It was developed on the basis of the independent, dependent and control variables identified in the current literature. This framework measured the impact of WCM and CG components on FP, as independent variables, and FP, as the dependent variable. Control variables used are, firm size, liquidity ratio, and sales growth. The two-way arrow between the independent and dependent variables (from FP to WCM-CG) represents the potential endogeneity problem that is resolved through static and dynamic relationships using the system General Method of Moments (SGMM). This is discussed in further detail in Chapter 5.

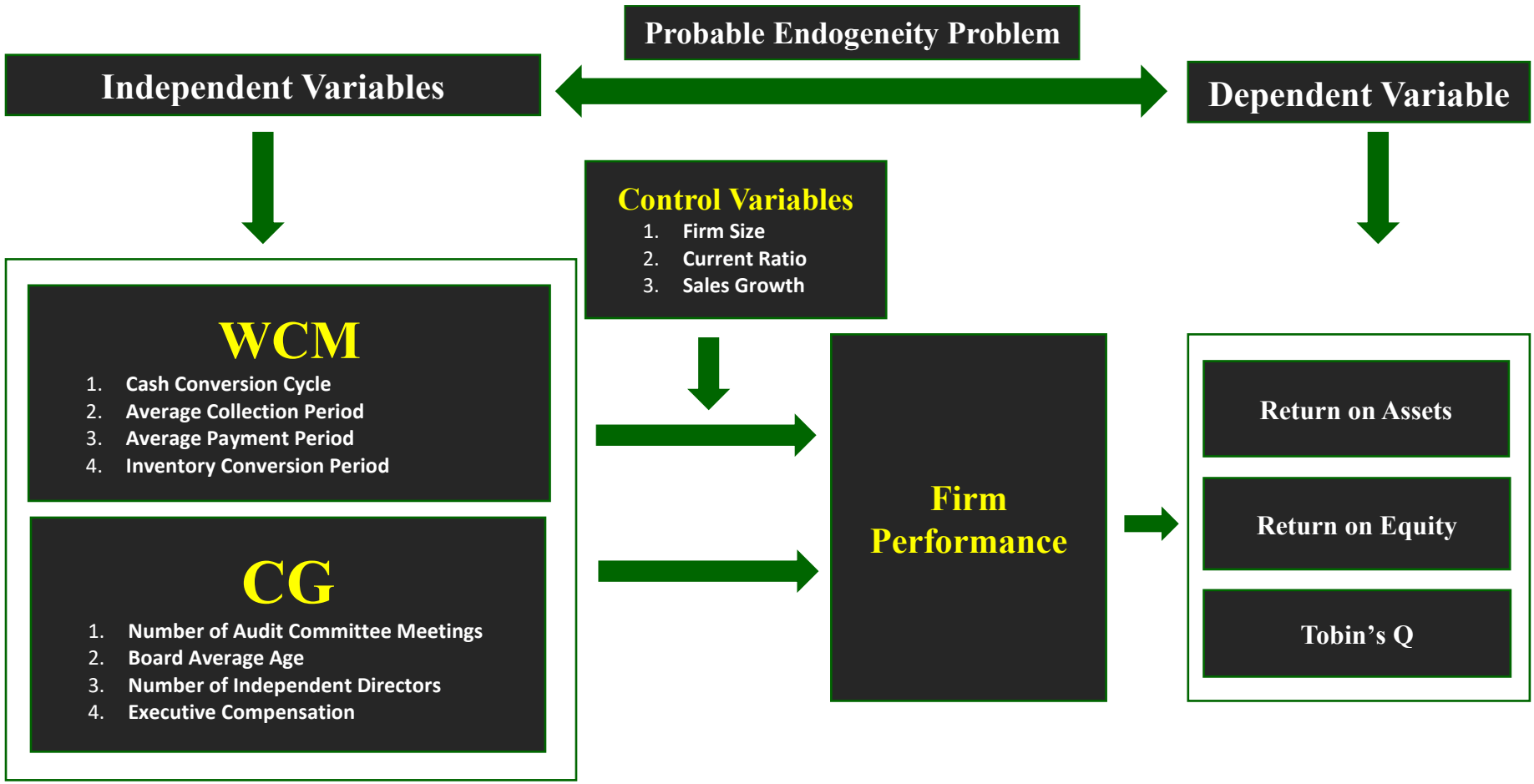

Figure 3.1 Study's Conceptual Framework

3.4 Variables

This section discusses the study's independent variables, dependent variables, and control variables presented in the conceptual framework above. These variables are defined in Table 3.1.

3.4.1 Dependent Variables

Previous studies have considered FP as the dependent variable. It is commonly used in evaluating the financial performance of the firm under investigation (Baños-Caballero et al., 2014). Various proxies, based on accounting measures, have been used to investigate the empirical relationship between WCM-CG and FP, such as net profit margin, return on invested capital, gross operating income, return on assets and equity, Tobin Q and market to book value ratio. In this study , performance is measured using three parameters; namely, accounting performance (ROA) (see Appel et al. (2016);Aktas et al. (2015)), operational performance (ROE) (see Adjaoud et al. (2007)) and market performance (TQ) (see Harford, Mansi, and Maxwell (2012); Shehata et al. (2017)).

These proxies have been extensively used and supported in prior empirical studies investigating the relationship between WCM-CG on FP. ROA calculates a firm's earning power by using a dollar of asset and ROE calculates the same by considering a dollar of equity. Tobin's Q ratio represents the market value of assets which a company holds. It is calculated by dividing the total market value with the total asset value of the company. These are considered to be the best indicators for measuring FP, keeping in mind the available resources. Another justification for using these measurement is that they allow for easy comparison with prior studies (Deloof, 2003; Tauringana & Adjapong Afrifa, 2013). This study uses ROA as a main variable to measure firm performance, along with ROE and TQ's to check for robustness (Nadeem, Gan, & Nguyen, 2017a; Nguyen, Locke, & Reddy, 2014).

ROA, ROE and Tobin's Q are given as follow:

$$ROA = NI / TA \tag{3.1}$$

$$ROE = NI / TE \tag{3.2}$$

$$Tobin's\ Q = MV / BV \tag{3.3}$$

Where NI is total net income left for shareholders, TA is total assets, TE is total shareholders' equity in the business, MV is market value and TAV is total asset value.

3.4.2 Independent Variables

This study has two major sets of independent variables. The first set of independent variables is related to WCM and its components (cash conversion cycle, average collection period, average payment period, and inventory conversion period) (Aktas et al., 2015). Based on prior studies (Deloof, 2003; Tauringana & Adjapong Afrifa, 2013)CCC is used as a comprehensive measurement of WCM. CCC is the sum of average collection period (ACP) and inventory conversion period (ICP) obtained after subtracting the average payment period (APP) and is narrated as (ACP+ICP-APP). ACP is the number of days the firm requires to collect receivables and is computed by dividing AR by sales multiplied by 365. APP is the number of days taken by the firm to pay its financial obligations to its supplier/s and is calculated by dividing AP by the cost of sales multiplied by 365. Finally, ICP is the number of days for which inventory is being held by a firm. It is computed by dividing inventory by the cost of sales multiplied by 365.

The second set of independent variables address CG and its components. These are audit committee meetings (ACMs), board average age (BAA), executive compensation (EC) and number of independent directors (NID) (Adjaoud et al., 2007; Appel et al., 2016; Sila et al., 2016). The ACM is measured by the number of meetings held by the Audit Committee of the firm Board. The BAA is considered to be the average age of directors. EC refers to the compensation paid to executive members of the board. Finally, NID are external directors on the firm's board.

3.4.3 Control Variables and Measurements

Prior studies have shown that control variables (such as firm size, sales growth, current ratio, GDP, leverage and firm age), can affect the relationship between WCM, CG and FP (Adjaoud et al., 2007; Aktas et al., 2015; Damodaran, 2012). In order to have robust results, prior studies include some variables as control variables, which are specific to firms (Tewodros, 2010). These variables are considered in this study in order to avoid the possibility of omitted bias (Bartov, Gul, & Tsui, 2000). Smaller firms have limited resources and power and may face difficulties when competing with larger firms in a highly competitive environment (Majumdar, 1997). This is because larger firms hold expertise in areas of marketing, product development, research abilities and advanced technology, all of which are fundamental for

achieving higher profitability (Dewar & Dutton, 1986). Nguyen and Nguyen (2015) and Li and Rama (2015) argue that FP may be affected by certain macroeconomic variables such as growth, size, and liquidity . Firm size is measured by counting the total number of employees and is considered to have a positive relationship with FP(McWilliams, 2000). Moreover, Mathuva (2010) determined a positive relationship between FP and firm size. It is claimed that a firm's liquidity levels may affect its performance. Tauringana and Adjapong Afrifa (2013) documented a negative relationship between liquidity and performance. The liquidity ratio (CR) is computed by dividing current assets by current liabilities at the closing of the financial year. Various empirical studies have also reported that FP can also be affected by growth opportunities (Deloof, 2003; Shin & Soenen, 1998). Generally, growth opportunities are reflected in stock returns. Growth is considered to be a necessary ingredient for FP and for creating shareholder value (Shin & Soenen, 1998). It is measured by the ratio (Sales 1-Sales 0)/Sales 0. Hence, firm variables such as firm size, liquidity ratio, and growth are used as control variables in this study (Adjaoud et al., 2007; Aktas et al., 2015; Damodaran, 2012). The omission of these variables could raise concerns about missing factors correlated with the main independent variable.

Table 3.1 Variable and Measurements

Variables	Abbr.	Measurement
Independent		
Cash Conversion Cycle	CCC	Time taken by firm to convert investments and other resources into cash.
Average Collection Period	ACP	The days taken by firm to collect its credit sales.
Average Payment Period	APP	The days taken by firm to pay suppliers.
Inventory Conversion Period	ICP	Days taken by firm to use or sell inventory.
Board Average Age	BAA	Average age of directors.
Audit Committee Meetings	ACM	Meeting held by audit committee of the board.
Executive Compensation	EC	Total compensation paid to executives.
Number of Independent Director	NID	External directors on board.
Dependent		
Return on Assets	ROA	Net Income/Total Assets
Return on Equity	ROE	Net Income/Total Equity
Tobin's Q	TQ	Market Value of the shares/Book value of the total shareholders' equity
Control		
Firms Size (FS)	FS	Number of Employees
Current Ratio	CR	Current Assets/Current Liabilities
Sales Growth	SG	Sales 1-Sales0 /Sales0

3.5 Sample and Data

This section discusses the study's sample markets, as well as the firms, and sources of data.

3.5.1 Sample Markets and Firms

The MSCI index has categorised the world markets into three types; developed, emerging and frontier markets. To address the empirical gap identified in the literature, six markets from each developed, emerging and frontier markets were initially selected. However, this study includes six markets from developed markets only. Emerging and frontier markets were dropped from sample due to the non-availability of required data for our variables in the *Bloomberg* database. This limitation is discussed further in Section 6.6. Furthermore, these six selected markets have the same CG framework (Bouchez, 2007; OECD, 2017), which enables comparisons to be made and easier interpretation of the results in terms of the CG

variables. These six markets were selected on the basis of equal weight; two developed markets were selected from each sub-region (America, Europe & Middle East, and Pacific)[4]
The following criteria were applied to select the markets.

Criteria 1: *GDP per Capita*

GDP per capita was the first selection criterion because the existing literature supports FP measurements based on GDP growth (Dewenter & Malatesta, 2001). Good economic conditions affect firm management efficiency and are measured on the basis of GDP trends(Lamberson, 1995). Therefore, of the top six markets, two from each region of developed economies, were selected based on their GDP per capita[5] as presented in Table 3.2 (Al-Iriani, 2006; Chen, Milesi-Ferretti, & Tressel, 2013; De Jong, Kabir, & Nguyen, 2008; Kwan, Yeung, & Au, 2003).

Criteria 2: *Knowledge Economy Index (KEI)*

Debresson (1989) argues that innovation is a source of dynamic growth and structural transformation, even in less developed countries. However, innovation depends on the use of trained labour, investments in R&D, regulatory systems, and performance. All of these elements contributed toward the formation of knowledge-based economies, which is one of the key drivers for economic growths in developed markets. Cañibano, Garcia-Ayuso, and Sanchez (2000) argue that most manufacturing economies are quickly replaced by knowledge-based economies, which in turn, increases the importance of WCM. Hence, the Knowledge Economy Index[6] (KEI) score was the second selection criterion. The top six markets (based on the KEI Index) were selected, as shown in Table 3.2.

Criteria 3: *Market Capitalisation (MC)*

Market capitalisation was selected as the third and final criterion. According to Altman (1968), the working capital/total asset ratio is generally found in corporate studies which investigate FP. MC is defined as a measurement of liquid assets in comparison to total capitalisation. Thus, on the basis of the third criteria (market capitalisation)[7]the top six markets were also selected.

[4]The list of countries is available on https://www.msci.com/market-classification
[5] Lists of countries ranked by GDP per capita were obtained from IMF 2016 GDP per capita list.
[6] KEI data was obtained from World Bank development indicators
[7] MC data was also obtained from World Bank development indicators

To sum up, the top six markets were selected from developed markets on the basis of GDP per capita, KEI, and MC, and were compared with each other (GDP-KEI, KEI-MC, and GDP-MC). In this way, a list of common markets was generated. From these common markets, the top two markets from each region (Americas, Europe and the Middle East, and the Pacific) of the developed markets (as classified by MSCI)were selected. Therefore, in total, six markets were selected based on the highest ranking of GDP per capita, KEI and market capitalisation value. GDP per capita was data sourced from IMF GDP per capita 2016. KEI scores and MC lists were obtained from World Bank Development Indicators (2013).

The next step involved selecting firms from these markets. Lamberson (1995) and Christopher and Kamalavalli (2009)argue that WCM is necessary for all firms (small or big, public or private) and neglecting WCM is risky because it may raise questions about its survival and also about its performance. Harford et al. (2012) and Mitton (2002) also emphasise the need and importance of CG in assessing FP. The advantages in selecting public listed firms are obvious. First, data is publicly available. Second, the data is reliable as publicly listed firms are audited. As a sub-criterion, the top indexed publicly listed firms of the six selected markets were selected for the period of 2007-2016. The 10 year period was chosen in light of Wintoki, Linck, and Netter (2012) argument that any period shorter than this will produce biased results. The proposed time period also includes the 2008 GFC. Furthermore, the selected firms have undergone further data sorting and cleaning. In light of Appel et al. (2016) and Nadeem et al. (2017a) firms which have data less than four years old were dropped from this research and equities with negative data were also dropped since they cannot be transformed by log functions (discussed in detail in the log transformation section).

Table 3.2 presents the sample markets and the number of firms selected for this study, from developed economies, based on KEI, GDP per capita and MC;

Table 3.2 Sample Markets from Developed Markets

S.No.	Markets	Index	Number of Selected Firms
		America Region	
1.	Canada	S&P/TSX Composite Index	248
2.	The United States	S&P 500 Index	506
		Europe & Middle East Region	
3.	France	CAC All Shares Index	509
4.	The United Kingdom	FTSE All Share Index	632
		Pacific Region	
5.	Australia	All Ordinaries Index	484
6.	Hong Kong	Hang Seng Composite Index	472

3.5.2 Source of Data

Financial data, including WCM components, dependent variables and control variables and CG data of the selected publicly listed firms, for the period 2007-2016, was extracted with the help of the *Bloomberg* database. The data was extracted from the financial statements and non-financial disclosures of the sample firms.

3.5.3 Data Transformation (Natural Log)

This study includes the publicly listed firms of six markets, from developed markets. The data of these markets have some unique features, such as variations in firm size, and the independent variables and dependent variables (ratios) are in percentages, such as ROA, ROE, Tobin's Q and liquidity ratio. Data transformation in quantitative studies helps to refine the quality of statistical analysis (Osborne, 2005; Osborne, 2002). Osborne (2002) discusses three main techniques for data transformation: logarithm, inverse transformations, and square root and recommends the use of a log function to improve the data distribution. Keene (1995)also supports the use of logarithm for data transformation. Charbaji (2011)argues that for better statistical evaluation, data should be transformed using the log function in order to address data skewness, which may occur due to ratio variables. Gujarati (2008)also argues that in econometric analysis, transformation through the log function is the most popular, as it measures the rate of change in slope coefficient (β) Y against X variables. However, data with negative values could not be dealt using the log transformation (natural log) as a log of negative value is not defined. Therefore, in light of Charbaji (2011); Gujarati (2008) and

Osborne (2005) studies, a natural logarithms has been used to increase the efficiency of our analysis and to address the negative values in our dataset.

3.6 Prior Studies 'Methodology on the WCM-FP and CG–FP Relationship

Tables 3.3 and 3.4 summarise prior studies that have used quantitative methods and techniques to study the impact of WCM on FP and the impact of CG on FP. These studies provided a methodological the base for this study.

Table 3.3 Prior Studies' Methodology on the WCM-FP Relationship

Previous Studies	Aim of Study	Quantitative/Model/Technique
Anarfi and Boateng (2016)	To investigate the relationship between WCM-FP in the Czech Republic forest industry.	Regression Model-Panel data multiple regression analysis
Arshad and Gondal (2013)	To study the empirical relationship between WCM-FP in the Pakistani Cement Industry.	Regression Model-Simple Linear Regression
Attari and Raza (2012)	To measure the effectiveness of firms listed on the Karachi Stock Exchange while managing WCM.	Regression Model- One-Way ANOVA and Pearson correlation
Bhatia and Srivastava (2016)	To analyse the impact of WCM-FP in emerging economies while considering India as a source country.	Regression Model-OLS-Fixed & Random Effect
Haron and Nomran (2016)	To examine the impact of WCM before, during and after the financial crisis of 2008 in Malaysian firms.	Regression Model-Panel Regression-Fixed Effect.
Javid and Zita (2014)	To determine the empirical relationship between WCM-FP for the cement industry in Pakistan.	Regression Model- Ordinary Least Square Regression
Mbawuni, Mbawuni, and Nimako (2016)	To determine the relationship between WCM-FP in the petroleum sector of Ghana.	Regression Model- descriptive analysis correlation and panel data method
Samiloglu and Akgün (2016)	To examine the empirical relationship between the WCM-FP for listed firms in the Istanbul Stock Exchange.	Regression Model- Multiple Linear Regression
Shan, Mun, Onn, Yee, and Chuan (2015)	To investigate the impact of WCM on the performance of wholesale and property industry in Malaysia.	Regression Model- Linear Regression

Source: Author's compilation based on the literature.

Table 3.4 Prior Studies' Methodology on the CG-FP Relationship

Previous Studies	Aim of Study	Quantitative/Model/Technique
Beasley (1996)	To investigate the impact of the of CG components (BoD composition) in relation to FP.	Regression Model-Logit Regression
Bhagat and Black (2000)	To evaluate the impact of board interdependence on firms long-term performance.	Regression Model- OLS Regression- three-stage least squares (3SLS) regressions.
Boyd (1995)	To analyse the impact of CEO duality on FP.	Regression Model- Linear Regression
Buallay, Hamdan, and Zureigat (2017)	To measure the impact of CG on FP for Saudi listed firms.	Regression Model- OLS- Panel Data Fixed Effect
Cronqvist and Nilsson (2003)	To study the impact of CG determinant i.e. agency costs on FP.	Regression Model- Fixed Effect Regression Model-Panel Data Fixed Effects
Dabor, Isiavwe, Ajagbe, and Oke (2015)	To investigate the impact of CG on FP for Nigerian Stock Exchange.	
Daily and Dalton (1994)	The study was conducted to determine the relationship between governance structures and corporate bankruptcy.	Regression Model-Logit Regression
Gul, Sajid, Razzaq, and Afzal (2012)	To investigate the impact of ownership and concentration on dividends for six Latin American countries.	Regression Model- OLS- Panel Data Fixed Effect
Singh and Davidson III (2003)	To investigate the relationship between agency costs, ownership structure, and FP.	Pooled Regression Model- Fixed Effect- Random Effect
Vo and Phan (2013)	To determine the empirical relationship between CG and FP for Vietnamese firms.	Regression Model- flexible generalized least squares (FGLS) technique
Yilmaz and Buyuklu (2016)	To investigate the impact of CG on FP in Turkey.	Regression Model-Panel Data Fixed Effects

Source: Author's compilation based on the literature.

3.7 Data Analysis Methods

This section discusses the various methods used to investigate the relationship between WCM-FP and CG-FP. The main objective of any research is to address the research questions by providing information(Saunders, 2011; Zikmund, 2003). The required information is gathered in the shape of raw data and then transformed with the help of analytical methods for making decisions (Davis, 1998). According to Zikmund (1997), when selecting the appropriate data analysis methodology, researchers must consider three main factors for deriving the right conclusion. These include (1) the research questions to be addressed; (2) the number of independent/dependent variables and (3) the measurement scale.

The ultimate purpose of this research to better understands the relationship between WCM-CG and FP. This relates to prior empirical studies which analyse the impact of WCM-CG and FP. As discussed in Tables 3.3 and 3.4, these studies have used different methodologies, such as pooled least square, generalised least square, panel data regression, Pearson's correlation regression, logit regression and OLS regression. Since the main objective of this study is to investigate the association between independent variables (components of WCM and determinants of CG), this research employs regression analysis to measure this relationship. To achieve these objectives, this study begins with a basic linear regression model (BLRM) and applies OLS estimations, such as panel data analysis (Aktas et al., 2015; Baltagi, 2008; Gujarati, 2008).

The panel data technique sets out a number of repetitive observations of cross sections of individuals, firms, and countries. It includes time series observations of countries, firms, and individuals over the chosen time period. It consists of two main dimensions: (1) time series and (2) cross sections, which help to provide enough information about data. The panel data methodology is used because of its benefits, such as the assumption that firms are heterogeneous, have less collinearity, have higher degrees of freedom and having more informative data (Baltagi, 2008; Baltagi & Kao, 2001).

Time series studies often experience multicollinearity (Pesaran & Pesaran, 2010). According to Raheman and Nasr (2007) panel data regression is more useful for studying the dynamics of adjustment in comparison to cross sections or time series data. In panel data regression, several cross-sectional units are observed over a period of time which cannot be observed in pure cross section data (Hsiao, 2003). Furthermore, panel data is more efficient when studying quantitative data, as it permits for more "variation in the micro-data to be used in

constructing parameters estimates, as well as permitting the use of relatively simple econometrics techniques" (Bond 2002, p 142). To obtain consistent estimators in the presence of omitted variables, panel data technique can be considered with few assumptions (Wooldridge, 2002). These omitted variables are linked with error terms while using cross section data. If these are linked with the dependent variable, then OLS will give biased estimates. This is a major issue for researchers who only use cross section data. Regardless of the various advantages of panel data, there are some limitations as well. Firstly, designing surveys and the data collection using this method is time consuming. Secondly, measurement errors may occur due to improper responses from the respondents. Finally, selectivity issue may arise. However, these limitations are only be applicable in the case of survey based studies. Since this research used secondary data, these issues are less likely to occur and will not have any serious impact on the results validity and expansion of results of this research. The empirical model of the study is presented below:

$$FP_{it}\ (ROA, ROE, Tobin's\ Q,) = \alpha + \beta_1 WCM_{it} + \beta_2 CG_{it} + \beta_3 Control_{it} + \beta_4 YEAR_{it} + \varepsilon_{it} \quad (3.4)$$

where i stands for the ith firm, t stands for year t, β stands for Intercept coefficient, εit stands for time-varying disturbance term serially uncorrelated with mean zero and variance one. Random error term for firm i at time t and year is a dummy variable. The variables and their measurements used in the equations are defined in Table 3.1.

3.7.1 Data Analysis Software

The descriptive analysis of the selected markets was estimated using SPSS (version 23). However, static models (such OLS & fixed effects), or dynamic panel data estimation, such as system GMM and analytical tests, such as Pearson pairwise correlation, autocorrelation, unit root, and heteroscedasticity were estimated by Stata software (version 13). These are discussed in greater detail in Chapters 4 and 5.

3.8 Chapter Summary

The existing literature on the relationship of WCM and CG with FP can be divided into two main categories: quantitative and qualitative studies. Both have their pros and cons. For example, quantitative models provide numerical results which can be easily interpreted and

compared with other firms and industries. In contrast, qualitative models provide limited information because of firm characteristics and are difficult to interpret (Sydler et al., 2014). Quantitative methods rely on financial data obtained from annual reports, while qualitative methods rely on surveys and questionnaires.

This chapter has outlined the methodology chosen for this study. It has discussed the various methodologies that have been used by previous studies. It has investigated the empirical relationship between WCM and CG on FP (summarised in in Tables 3.3 and 3.4). The chapter has also outlined the three different criteria for selecting the sample from the developed markets (see section 3.2). The current study uses WCM components (CCC, ACP, APP, and ICP) and CG components (NID, ACM, BAA and EC) as independent variables, while performance measures (ROA, ROE and Tobin's Q ratio) are used as dependent variables. Firm size, liquidity ratio and sales growth are used as control variables, since these might affect firm performance. The MSCI World Index has divided the world markets into three markets: developed, emerging and frontier markets. The focus of this study is developed markets only, not emerging and frontier markets due to the non-availability of financial and CG data for emerging and frontier markets. The MSCI Index classifies developed market into three regions; America, Europe and the Middle East and the Pacific**.** Hence, the research includes six markets in total, with the top two markets from each region, selected on the basis of three criteria: GDP, Knowledge Economy Index, and Market Capitalisation. Considering prior studies, publicly listed firms at the top of the respective, indexed markets were selected as samples for this research. The financial and governance data was obtained from the *Bloomberg* database. The issue of data skewness has been addressed by using the log function on the basis of the extended literature. The following two Chapters (4 and 5) provide a summary of the results.

Chapter 4
OLS and Fixed-Effect Results

4.1 Introduction

This chapter discusses the empirical results on the impact of WCM and CG on firm performance, based on the OLS & Fixed-Effects (FE) estimations. Section 4.2 addresses the descriptive statistics of the data. Section 4.3 outlines the diagnostics tests used, such as unit root test for stationarity of the data and the Pearson pairwise correlation test for multicollinearity, followed by the OLS and FE results. Section 4.4 explains the robustness tests (heteroscedasticity and autocorrelation) used to check the reliability of the OLS and FE estimates. While section 4.5 outlines problems and solutions for OLS and FE estimates, section 4.6 summarises the chapter.

4.2 Descriptive Statistics

This section presents the descriptive statistics of the data (see Table 4.1). Table 4.1 discusses the descriptive results of the dependent variables (ROA, ROE, and TQ's) followed by the explanatory variables for WCM (CCC, ACP, APP, and ICP) and CG (NID, ACM, BAA and EC), for the six developed markets.

The mean value of CCC varies from 43.00 to 303.50 days, with an overall average mean of 106.09 days. In light of Theodore Farris and Hutchison (2002) work, firms with a lower number of CCC days are better and more efficient than firms with a higher number of CCC days. Hong Kong exhibits the highest number of days (303.50), while Canada exhibits the lowest (43.00) number of days. This implies that Canadian firms are more efficient in terms of CCC than the rest of the five developed markets. The mean values of CCC days are consistent with Deloof (2003)study Belgium (on average 44 days), Juan García-Teruel and Martinez-Solano (2007)on Spain (on average 76 days), Tingbani (2015)on the UK (on average 66 days) and Pais and Gama (2015)on Portugal(on average 179 days).

In terms of the ACP, the mean value varies from 45.00 days to 154.79 days, for the six developed markets, with an overall mean value of 74.57 days. Firms which collect their credit sales at the earliest possible time are considered to be the most efficient in the context of WCM. The result shows that the US is the most efficient market in collecting credit sales, with an average collection period of 45 days, in comparison to its counterparts in the research

sample. Australia is the least efficient market with an average collection period of 154.79 days. The result is consistent with Uyar (2009)work on Turkey.

The mean value for APP varies from 62.01 to 95.19 days, with an overall mean of 76.35 days. The UK market exhibits an average of 95.19 days delay in making payments to creditors, followed by the US market with 62.01 days. The result is consistent with Tingbani (2015) study on the UK (on average 96 days).

In terms of ICP, the mean value varies from 59.08 days to 101.98 days, with an overall mean of 76.72 days. The UK firms hold inventory for a longer period of time (101.98 days), while Canadian firms hold it for a shorter period of time (59.08 days). This is consistent with Juan García-Teruel and Martinez-Solano (2007)work on Spain (on average 77 days) and Tingbani (2015)work on the UK (on average 102 days).

The other important independent variable of this research is CG components. In terms of NID, the mean value varies from 3.57 to 8.41, with an overall mean value of 5.64 of independent directors. The US exhibits the highest (8.41), while Hong Kong exhibits the lowest number (3.57) of independent directors on boards. The results are consistent with those reported by Liu, Miletkov, Wei, and Yang (2015)for China (3.00 independent directors on board) and Armstrong, Core, and Guay (2014) for the US (8.00 independent directors on board). The minimum value of zero in France and Hong Kong means that some of the firms either do not have independent directors or they have not provided this information.

The mean value for ACM varies from 3.07 to 7.90, with an overall mean value of 4.72 for audit committee meetings. The US exhibits a higher number of ACM's, with an average of eight meetings per year, while Hong Kong exhibits the lowest number (3.07) of meeting per year. This means that ACM's are more frequent in the US than the rest of the developed markets. The minimum value of ACM in Australia and Hong Kong is zero, meaning that either some of the firms still do not have any audit committee meetings, or some firms have not provided this information. The results are consistent with those reported by Allegrini and Greco (2013) for Italy (4.56 audit committee meetings on average),Bansal and Sharma (2016) for India (5.02 audit committee meetings on average) and by Jermias and Gani (2014) for the US (5.62 audit committee meetings on average).

In terms of BAA of members, the mean value varies from 55.08 to 62.02 years, with an overall mean value of 59.17 years for developed markets. The US has the oldest on average, board

of director members (62.02 years), whereas Hong Kong has youngest (55.08 years). The minimum value for board members' age is 33.60 years, while the maximum is 83.11 years. The results are consistent with those reported by Bonn (2004) for Australia (average age for board of directors is 60 years) and Carter, D'Souza, Simkins, and Simpson (2010) for the US (average age is 59.35 years).

The logarithm function has been used to analyse the data for EC, because log function helps to measure propionate values of variables rather than their dollar values (Core, Holthausen, & Larcker, 1999). It also helps to refine the quality of statistical analysis(Osborne, 2005; Osborne, 2002). The EC mean value varies from $14.75 to $17.02, with an overall mean value of $15.76. The US exhibits the highest number of EC paid, with an average of $17.02 whereas France has the lowest ($14.75) among the sample countries. This is consistent with O'Reilly, Doerr, Caldwell, and Chatman (2014) results for the US ($13).

Finally, for the dependent variables, the mean value of ROA varies from 3.08% to 9.27%, with an overall mean value of 5.74%. The ROE mean value varies from 7.69% to 24.98%, with an overall mean value of 14.13%. The results are consistent with those reported by Juan García-Teruel and Martinez-Solano (2007) for Spain (ROA is 7.9%), and Tingbani (2015) for the UK (ROA is 6.9%) and by Nadeem, Gan, and Nguyen (2017b), for Australia (ROE is 21.99%). Similarly, Tobin's Q mean value varies from 1.44% to 2.31%, with an overall mean value of 1.73%.

Table 4.1 Descriptive Statistics

Countries	Obs.	Variables	ROA	ROE	TQ	CCC	ACP	APP	ICP	NID	ACM	BAA	EC
The United States	2936	Mean	9.27	24.98	2.31	60.04	45.00	62.01	64.53	8.41	7.90	62.02	17.02
		Median	8.33	18.73	1.92	63.69	7.732	8.82	6.10	9.00	8.00	62.11	17.02
		Minimum	0.02	0.16	0.81	0.15	1.35	0.89	0.55	3.00	2.34	33.60	13.39
		Maximum	46.70	527.88	13.63	716.70	251.29	929.77	53.70	14.00	14.00	83.11	19.89
Canada	544	Mean	3.08	7.69	1.56	43.00	54.44	69.46	59.08	6.59	4.64	61.53	16.07
		Median	4.12	9.21	1.36	35.03	7.81	5.92	8.28	7.00	5.00	62.00	16.04
		Minimum	-105.70	-89.76	0.00	-871.60	0.82	-1.03	0.86	4.00	7.00	36.20	9.79
		Maximum	35.66	81.18	8.35	4057.47	874.66	586.06	35.54	14.00	18.00	72.22	19.50
The United Kingdom	1323	Mean	6.84	18.35	1.84	63.67	62.47	95.19	101.98	5.09	4.06	56.94	14.87
		Median	6.10	14.40	1.53	51.79	8.40	7.61	51.18	5.00	4.00	57.00	14.82
		Minimum	-53.54	-101.85	0.00	-5088.28	1.40	0.97	0.19	3.12	2.00	44.80	9.95
		Maximum	67.10	467.64	8.70	5864.25	4404.5	599.38	568.39	14.00	14.00	70.00	18.24
France	428	Mean	3.80	9.83	1.44	99.53	57.51	78.40	69.15	5.86	4.34	59.17	14.75
		Median	3.95	10.99	1.29	62.55	5.76	4.50	5.04	6.00	4.00	59.61	14.68
		Minimum	-23.06	-98.77	0.758	-6177.98	0.02	-1.31	0.32	0.00	2.12	50.33	12.66
		Maximum	35.25	15.20	5.49	19026.39	507.01	629.55	109.27	14.00	15.00	68.60	17.59
Australia	599	Mean	5.06	10.59	1.69	66.81	154.79	79.15	73.81	4.37	4.32	60.30	15.38
		Median	5.98	11.26	1.40	55.78	9.77	7.46	4.97	4.00	4.00	60.33	15.32
		Minimum	-90.50	-172.41	.3415	-6259.89	1.13	-3.87	0.47	2.25	0.00	51.00	12.99
		Maximum	49.10	183.30	8.43	7871.75	730.32	157.42	42.99	8.00	14	68.88	17.33
Hong Kong	877	Mean	6.43	13.36	1.58	303.50	73.25	73.90	91.82	3.57	3.07	55.08	16.51
		Median	5.20	12.84	1.18	91.43	9.65	6.67	4.18	4	3.00	54.88	16.57
		Minimum	-36.37	-87.25	0.37	-3409.29	0.53	-231.00	0.75	0.00	0.00	36.07	10.30
		Maximum	49.38	58.53	35.34	4991.56	314.06	173.36	36.26	8.00	16.00	76.80	19.35
Average Overall Mean			5.74	14.13	1.73	106.09	74.57	76.35	76.72	5.64	4.72	59.17	15.76

Note: Obs. stands for the total number of observations.

4.3 Multiple Regression Results

This section presents the regression (OLS and fixed-effect) results, used to measure the relationship between WCM-FP and CG-FP and firm performance. In light of prior studies, (Aktas et al., 2015; Baltagi, 2008; Sila et al., 2016) this study began with OLS before using fixed-effect estimation and some basic diagnostics tests. This study analysed possible flaws using static estimation and demonstrates how prior studies have ignored the dynamic nature of this area of study (see section 4.5).

4.3.1 Diagnostics Tests

In order to apply the OLS estimation, it is important to apply diagnostics tests on the dataset. These tests check the basic assumptions of Classic Linear Regression Model (CLRM) as recommended by Guass Markov's (Mills, 2014).It includes the unit root test for stationarity in the data (section 4.3.1.1), the Pearson pairwise correlation test and the variance inflation factor test for multicollinearity (section 4.3.1.2). The study also conducted advanced diagnostic tests such as Bruesch-Pagan/Cook-Weisberg and the Wooldridge test for autocorrelation (discussed in section4.4).

4.3.1.1 Data Stationarity

Testing for stationarity in panel data has become important in recent years, in order to determine whether the mean and variance are time dependent (Maddala & Wu, 1999)**.** The basic assumption of CLRM is that the current and past values of data should be independent. According to Gujarati (2008)**,** the use of CLRM on non-stationarity data will produce biased and inconsistent results. Furthermore, Gujarati also explains that the results produced in such situations would be meaningless. Hence, Gujarati suggests checking the data for stationarity before applying CLRM. Maddala and Wu (1999)recommend using the Fisher-Type p test for panel data tests, such as the unit root test, instead of the Lavin-Lin test or the IM-Pesaran-Shin test since only *Fisher-Type p test* incorporates the unbalanced nature of panel data. This test allows different lag lengths in the Augmented Dickey-Fuller test, but it is for smaller N. Choi (2001) presents the modified version of the Fisher-Type unit root test with the larger N. This study applied both the original and modified version of the Fisher-Type p test to check for stationarity of the data in our unbalanced panel data. The formula is written as follows;

$$P = -2\sum_{i=1}^{n} ln\,(\pi_i) \rightarrow \chi^2\,2N \tag{4.1}$$

$$Pm = \frac{1}{2}\sqrt{n}\sum_{i=1}^{n}(-2\,ln\,\pi_i - 2) \rightarrow N\,(0,1) \tag{4.2}$$

Where, π_i represents p values of any individual for unit root test for cross sections i, χ^2 stands for asymptotic, and N represents degree of freedom. The null hypothesis is that the unit root exists in the panels. Table 4.2 presents the results of Fisher-Type p test and modified Fisher-Type p test for all markets with dependent variables (ROA, ROE, and TQ's) respectively. The results show that the null hypothesis can be rejected, which means that there is no issue of unit root in our data. This shows that the mean and variances do not depend on time, and, according to Gujarati (2008), the application of CLRM produces meaningful results.

Table 4.2 Fisher-Type p Test and Modified Fisher-Type p Test

Markets	ROA		ROE		TQ's	
	Inv. Chi Sq.	**M-Inv. Chi**	**Inv. Chi Sq.**	**M-Inv. Chi**	**Inv. Chi Sq.**	**M-Inv. Chi**
The United States	1739.05*	31.45*	1598.35*	27.48*	2473.35*	52.20*
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Canada	563.87*	21.59*	576.42*	22.82*	633.23*	25.38*
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
The United Kingdom	894.50*	21.26*	1110.29*	29.53*	911.54*	21.91*
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
France	276.18*	11.20*	318.33*	14.04*	282.47*	11.62*
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Australia	446.3074*	12.96*	401.388*	10.68*	260.78*	3.51*
	(0.0000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Hong Kong	1502.64*	46.97*	1251.25*	37.00*	1318.54*	39.67*
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)

Note: The table presents the original Fisher-Type and Modified Unit Root tests with t-statistics (p-values) in parentheses. Inv. Chi. Sq. and M-Inv. Chi are Inverse Chi-Squared and Modified Inverse Chi-Squared Fisher Type ($P_{M)}$ respectively. *, ** and *** indicate significance at 1%, 5% and 10%, respectively.

4.3.1.2 Multicollinearity

In order to investigate the relationship between explanatory variables, this study employed bivariate analysis (Zikmund, 2003). This analysis tests the hypothesis that the relationship between two or more variables differs (Zikmund, 1997). This study implements Pearson's correlation coefficients to assess the relationship between the variables. According to Ghauri and Grønhaug (2005), Pearson's correlation coefficient reflects joint variations in two measures. The coefficient ranges between -1 to +1. The values close to -1 or +1 represent either negative or positive, but stronger association. Whereas, correlation having zero coefficient means that variables are unrelated. The correlation matrix is employed to determine whether the addition of different independent variables in our model will generate multicollinearity problems between the models. According to Baltagi (2008) and Gujarati (2008), another assumption of CLRM is that there should be no multicollinearity between the independent variables or regressors of panel data. Table 4.3 presents the correlation matrix for all continuous variables to check for multicollinearity using the Pearson pairwise correlation test. This test is applied in order to achieve two objectives. First, is to test the correlation among the independent and dependent variables and second, is to check the degree of correlation among the independent variables. According to Kennedy (2008) and Gujarati (2008), if the correlation among the variables is too strong (more than 0.80), this indicates the presence of multicollinearity and will violate the basic assumption of CLRM. According to Field (2005), if the correlation among the variables is greater than 0.87, then there is an issue of multicollinearity in the data. Table 4.3 shows that the correlation among the variables is below 0.50. However, in the case of NID and BAA the correlation is 0.66 and 0.56, respectively. Hence, most of the variables in our models do not suffer from any multicollinearity problems. Similarly, the variance inflation factor (VIF) is also another standard method to test for multicollinearity in data (Dormann et al., 2013; Pfarrer, Pollock, & Rindova, 2010). Kalnins (2018) and Ukaegbu (2014)argue that if the VIF of any individual variable exceeds 5 then it warrants investigation, but if it is greater than 10 then it indicates the presence of multicollinearity in the data set. The un-tabulated result of VIF is 2.21.This means that there is no issue of multicollinearity in our data set.

Table 4.3 Correlation Results

	ROA	ROE	TQ	CCC	ICP	ACP	APP	NID	ACM	BAA	EC
ROA	1.000										
ROE	0.6145*	1.0000									
	(0.0000)										
TQ	0.3846*	0.2791*	1.0000								
	(0.0000)	(0.0000)									
CCC	-0.0019	-0.0195	-0.1024*	1.0000							
	(0.8746)	(0.1103)	(0.0000)								
ICP	-0.0012	0.0138	-0.0089	-0.0229***	1.0000						
	(0.9234)	(0.2580)	(0.4638)	(0.0610)							
ACP	0.0408*	0.0250**	0.0218***	0.0040	0.0012	1.0000					
	(0.0008)	(0.0403)	(0.0742)	(0.7440)	(0.9198)						
APP	-0.0194	-0.0158	-0.0277**	0.0333***	0.0015	0.0247**	1.0000				
	(0.1123)	(0.1958)	(0.0231)	(0.0063)	(0.9015)	(0.0433)					
NID	0.0177	0.0606*	-0.0105	-0.0847*	-0.0286**	-0.0468*	-0.0235***	1.0000			
	(0.1465)	(0.0000)	(0.3892)	(0.0000)	(0.0192)	(0.0001)	(0.0542)				
ACM	0.0534*	0.0329*	0.0720*	-0.0745*	-0.0310**	-0.0259**	-0.0107	0.6695*	1.0000		
	(0.0000)	(0.0070)	(0.0000)	(0.0000)	(0.0110)	(0.0336)	(0.3796)	(0.0000)			
BAA	0.0819*	0.0546*	0.0395*	-0.0171	-0.0332*	-0.0703*	-0.0460*	0.5602*	0.4813*	1.0000	
	(0.0000)	(0.0000)	(0.0012)	(0.1627)	(0.0065)	(0.0000)	(0.0002)	(0.0000)	(0.0000)		
EC	0.0819*	0.0679*	0.0847*	0.0536*	-0.0266**	-0.0294**	-0.0013	0.2363*	0.2263*	0.2168*	1.0000
	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0295)	(0.0162)	(0.9177)	(0.0000)	(0.0000)	(0.0000)	

Note: The table presents the correlation results for all variables that estimate the relationship between WCM-CG and FP. *, ** and *** indicate significance at 1%, 5% and 10% levels, respectively. Control variables have also been included but are not reported here due to limited space.

4.3.2 OLS Estimation Results

This research began with traditional OLS estimation in light of prior studies (Appel et al., 2016; Nadeem et al., 2017a; Sila et al., 2016). Tables 4.4, 4.5 and 4.6 present the results of OLS estimation for three FP variables, namely ROA, ROE and Tobin's Q, respectively, where ROA is the main variable of interest. Model 1 includes WCM components (CCC, ACP, APP and ICP) as independent variables, along with the control variables (CR, SG, and FS) and the year dummies. Model 2 includes determinants (NID, ACM, BAA, and EC) of CG, as independent variables along with control variables (CR, SG, and FS) and year dummies. Model 3 includes components of both WCM and CG (CCC, ACP, APP, ICP, NID, ACM, BAA and EC) in a collective form, as independent variables along with the control variables (CR, SG, and FS) and year dummies. Table 4.4 presents the regression results for Models 1, 2 and 3 in terms of ROA. Table 4.4 shows that the CCC coefficient is negatively significant (at a 1% level) with FP, in all markets except the Australian market. This study's findings (negatively significant) are consistent with those reported by Deloof (2003) for Belgium, Lazaridis and Tryfonidis (2006b) for Greece, Juan García-Teruel and Martinez-Solano (2007) for Spain, Enqvist et al. (2014) for Finland and Tingbani (2015) for the UK, which also showed a significant negative relationship between CCC and FP. However, Australia exhibits a negative, but insignificant, relationship. Muscettola (2014) reported similar results for Italy.

The ACP coefficient in Table 4.4 is positive and significant at the 1% level for the US, and the UK. This finding is consistent with Sharma and Kumar (2011a) work on India. However, in the case of Canada and Hong Kong, the ACP coefficient is negatively significant at the 1% level. The results are consistent with Deloof (2003) for Belgium, Padachi (2006) for Mauritania, Lazaridis and Tryfonidis (2006b) for Greece, Juan García-Teruel and Martinez-Solano (2007) for Spain, Gill et al. (2010) for the US, Enqvist et al. (2014) for Finland, and Tingbani (2015) for the UK, which all documented significant negative relationships as well. However, in the case of France and Australia, ACP has no significant relationship with FP.

The APP coefficient in Table 4.4 is positive and significantly related to ROA at the 1% level for Canada and Australia. The positive results are consistent with those reported by Nobanee and Alhajjar (2009) for Japan, and Mathuva (2009) for Kenya. In the case of the US and France, the findings are negatively significant, with ROA at 1%.These findings are consistent with Deloof (2003) for Belgium, Padachi (2006) for Mauritania, Lazaridis and Tryfonidis (2006b) for Greece, and Enqvist et al. (2014) for Finland. The UK and Hong Kong show no significant

relationship and are consistent with Juan García-Teruel and Martinez-Solano (2007) on Spain, and Gill et al. (2010) work on the US.

The ICP coefficient is negatively associated with ROA for all six developed markets. However, it is negatively significant at the 1% level for Canada and 5% for the US, UK, and Hong Kong. These findings are consistent with Deloof (2003) for Belgium, Lazaridis and Tryfonidis (2006b) for Greece, Enqvist et al. (2014) for Finland, Juan García-Teruel and Martinez-Solano (2007) for Spain, and Nobanee and Alhajjar (2009) for Japan. However, France and Australia have no significant relationship. This is consistent with Gill et al. (2010) for the US, and Padachi (2006) for Mauritania.

Table 4.4 presents the regression results for ROA (Model 2); that is, the relationship between CG components and FP. The NID coefficient is negatively significant (at the 1% level) for the US, the UK, Australia and Hong Kong and is consistent with Ararat and Yurtoglu (2006) findings for Turkey, Cavaco, Crifo, Rebérioux, and Roudaut (2017) for France, and Haldar et al. (2018) for India. Canada exhibits a positive significant relationship with ROA at the 5% level and is consistent with Liu et al. (2015)and Duru, Iyengar, and Zampelli (2016). However, France shows a negative, but insignificant, relationship and is consistent with Johl, Kaur, and Cooper (2015) and Terjesen, Couto, and Francisco (2016).

The ACM coefficients are negatively significant (at a 1% level) for France and Australia and at the 5% level for the UK. The findings are consistent with the result reported by Anderson, Mansi, and Reeb (2004) and Johl et al. (2015) for Malaysia. In the case of the US, Canada, and Hong Kong the ACM coefficients are positive but insignificant. Leung, Richardson, and Jaggi (2014) reported similar findings for Hong Kong.

The members BAA coefficient is positive and significant with ROA at the 1% level for the US and UK. The findings are consistent with Carter et al. (2010) and Ferrero-Ferrero, Fernández-Izquierdo, and Muñoz-Torres (2015). In the case of Canada and Hong Kong, the BAA coefficient is negative and significant at the 1% level. Abdullah, Ismail, and Izah (2017)reported similar findings for Malaysia. In the case of France and Australia, no significant relationship has been found. Bonn (2004)reported similar findings in his study.

The EC coefficient is positive and significant with ROA at the 1% level, for five of the six developed markets (with the exception of Canada). The findings are consistent with Conyon (2014) and Ntim, Lindop, Osei, and Thomas (2015)and also in accordance with tournament theory. This theory states that high compensation will motivate lower level managers to

perform at their best in order to gain promotions and to reach the top level managers (Burns, Minnick, & Starks, 2017; Eriksson, 1999; Ridge, Aime, & White, 2015). However, in the case of Canada, the EC coefficient exhibits a negative and significant relationship at the 1% level.

Table 4.4 shows the results of ROA for Model 3 (WCM+CG). The results show that the model (WCM and CG components run collectively in one model) are significant at 1% and 5% levels, respectively. The results are consistent with model 1 and 2 results. The robustness of all three models was checked using two other FP measurement variables (ROE and TQ). Table 4.5 shows the results with the other performance measurement variable (that is, ROE). The ROE results are significant at the 5% level and are also quite similar with the results of ROA (see Table 4.4). However, mixed results are reported for TQ (see Table 4.6). The adjusted R^2, in the case of ROA, varies from 7% to 59%, for ROE varies from 3% to 61%, and is higher than R^2 in regression with ROA.

Prior WCM and CG studies consider OLS as an appropriate method to use when investigating the relationship with FP (Aktas et al., 2015; Baltagi, 2008; Sila et al., 2016). However, according to Baltagi (2008) and Gujarati (2012) there are certain assumptions for OLS that need to be checked for robustness. It is most likely that OLS produces highly significant results and a higher value of R^2 which is the same in our case as well. A major problem of OLS is that it does not discriminate between cross sections. The cross sections in this study are firms. This means OLS does not determine whether the effect of FP on WCM-CG is the same or different over time and cross sections. The CLRM suffers from heterogeneity problem due to difference in response over the time. This heterogeneity problem can be addressed by using the fixed-effect (FE) model because the FE model generates different intercepts. In other words, firm specific effects can be controlled in the FE model, which is not achievable in OLS. The next section presents and discusses the FE estimations for our models.

Table 4.4 OLS Results - ROA as Dependent Variable

	Model 1						Model 2					
Countries	**Intercept**	**CCC**	**ACP**	**APP**	**ICP**	**Adj. R^2**	**Intercept**	**NID**	**ACM**	**BAA**	**EC**	**Adj. R^2**
United States	4.22*	-0.103*	0.394*	-0.896*	-0.549**	0.15	-14.75*	-0.446*	0.008	0.828*	0.472*	0.13
	(0.000)	(0.000)	(0.000)	(0.002)	(0.042)		(0.000)	(0.000)	(0.858)	(0.000)	(0.000)	
Canada	1.833**	-0.141*	-0.233**	0.263*	-0.323*	0.19	11.630*	0.354**	0.220	-0.425*	-0.789*	0.09
	(0.020)	(0.004)	(0.041)	(0.005)	(0.002)		(0.001)	(0.031)	(0.202)	(0.007)	(0.000)	
United Kingdom	5.112*	-0.218*	0.641*	0.050	-0.966**	0.07	-34.543*	-2.486*	-0.372**	0.253*	1.449*	0.08
	(0.000)	(0.009)	(0.000)	(0.831)	(0.033)		(0.000)	(0.024)	(0.011)	(0.002)	(0.000)	
France	3.87*	-0.179*	-0.231	-0.263*	-0.055	0.23	1.527*	-0.039	-0.491*	-0.081	0.656**	0.24
	(0.000)	(0.116)	(0.135)	(0.006)	(0.733)		(0.000)	(0.702)	(0.000)	(0.212)	(0.030)	
Australia	6.78*	-0.019	0.020	0.196*	-0.009	0.08	-70.642*	-1.354*	-1.936*	0.606	6.420*	0.40
	(0.000)	(0.869)	(0.146)	(0.003)	(0.605)		(0.004)	(0.007)	(0.000)	(0.368)	(0.008)	
Hong Kong	5.016*	-0.276*	0.031	-0.003	-0.119**	0.19	10.043*	-0.486**	0.089	-0.126*	0.627*	0.12
	(0.000)	(0.000)	(0.708)	(0.706)	(0.040)		(0.001)	(0.022)	(0.550)	(0.008)	(0.001)	
					Model 3							
	Intercept	**CCC**	**ACP**	**APP**	**ICP**	**NID**	**ACM**	**BAA**	**EC**	**Adj. R^2**		
United States	-12.27*	-0.267*	0.269*	-0.005	-0.001	-0.496*	-0.036	0.729*	0.739*	0.14		
	(0.000)	(0.000)	(0.000)	(0.279)	(0.955)	(0.000)	(0.486)	(0.000)	(0.000)			
Canada	17.38*	-0.435*	-0.492**	0.471*	-0.452*	0.017	-0.081	-0.501*	0.189	0.59		
	(0.000)	(0.000)	(0.014)	(0.000)	(0.000)	(0.490)	(0.789)	(0.000)	(0.184)			
United Kingdom	-14.65*	0.020	0.424**	0.062	-0.026	-0.278	-0.331**	0.205*	1.24**	0.11		
	(0.000)	(0.766)	(0.014)	(0.165)	(0.229)	(0.174)	(0.039)	(0.002)	(0.024)			
France	3.49*	-0.231**	-0.588**	-0.104	-0.367**	-0.085	-0.280**	-0.287	0.112	0.12		
	(0.000)	(0.035)	(0.032)	(0.414)	(0.022)	(0.394)	(0.024)	(0.323)	(0.225)			
Australia	-15.58*	0.126	-0.211	0.852**	-0.016	-0.369*	-0.247*	-0.459	3.251**	0.28		
	(0.000)	(0.389)	(0.149)	(0.044)	(0.432)	(0.000)	(0.000)	(0.163)	(0.019)			
Hong Kong	6.40*	-0.182*	-0.69***	0.011	-0.130**	-0.314	-0.147	-1.911*	0.712*	0.14		
	(0.000)	(0.000)	(0.086)	(0.811)	(0.035)	(0.207)	(0.298)	(0.000)	(0.000)			

Note: The table presents OLS results with ROA as the dependent variable. The table presents the standard coefficient values (p-values in brackets) *, ** and *** indicate significance at 1%, 5% and 10% levels, respectively. Control variables, year dummies and industry dummies are also included and are available upon request.

Table 4.5 OLS Results - ROE as Dependent Variable

	Model 1						Model 2					
Countries	**Intercept**	**CCC**	**ACP**	**APP**	**ICP**	**Adj.R^2**	**Intercept**	**NID**	**ACM**	**BAA**	**EC**	**Adj. R^2**
The United States	1.75*	-0.115*	0.173*	-0.974**	-0.024**	0.03	-20.52*	-0.317*	0.001	0.217*	0.184*	0.05
	(0.000)	(0.000)	(0.000)	(0.019)	(0.004)		(0.000)	(0.000)	(0.948)	(0.002)	(0.002)	
Canada	3.33*	-0.263**	-0.257**	0.216**	-0.341*	0.09	8.040*	0.112	0.073	-0.527*	-0.341*	0.11
	(0.000)	(0.013)	(0.021)	(0.016)	(0.001)		(0.005)	(0.822)	(0.754)	(0.005)	(0.007)	
The United Kingdom	1.571*	-0.145*	0.787**	0.054	-0.110**	0.03	-38.979*	-0.581	-0.279**	0.603*	0.143*	0.06
	(0.000)	(0.007)	(0.024)	(0.933)	(0.033)		(0.000)	(0.556)	(0.018)	(0.001)	(0.002)	
France	3.17*	-0.089	-0.130	-0.288*	-0.022	0.07	4.087*	-0.025	-0.841**	-0.173	2.670**	0.07
	(0.000)	(0.423)	(0.125)	(0.001)	(0.644)		(0.000)	(0.838)	(0.002)	(0.825)	(0.037)	
Australia	13.40*	-0.023	0.021	0.395*	-0.098	0.07	-65.98*	-1.999**	-2.234*	0.182	3.530	0.41
	(0.000)	(0.377)	(0.623)	(0.004)	(0.682)		(0.003)	(0.040)	(0.006)	(0.814)	(0.394)	
Hong Kong	6.30*	-0.217*	0.022	-0.004	-0.149*	0.24	8.799*	-0.806**	-0.141	-1.995*	0.994*	0.11
	(0.003)	(0.004)	(0.510)	(0.529)	(0.004)		(0.000)	(0.034)	(0.535)	(0.000)	(0.000)	
	Model 3											
	Intercept	**CCC**	**ACP**	**APP**	**ICP**	**NID**	**ACM**	**BAA**	**EC**	**Adj. R^2**		
The United States	-40.49*	-0.119*	0.691*	-0.927**	-0.016**	-0.26**	-0.923	0.271 *	0.147*	0.05		
	(0.000)	(0.000)	(0.000)	(0.035)	(0.032)	(0.013)	(0.103)	(0.001)	(0.000)			
Canada	13.38*	-0.447*	-0.666*	0.412*	-0.501*	0.253	-0.889	-2.761**	0.791*	0.19		
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.208)	(0.744)	(0.025)	(0.000)			
The United Kingdom	-5.04*	-0.303*	0.117**	0.121	-0.290**	-0.387	-0.279**	0.095*	4.847*	0.08		
	(0.000)	(0.001)	(0.029)	(0.178)	(0.041)	(0.699)	(0.029)	(0.001)	(0.003)			
France	3.68*	-0.146**	-0.206**	0.276	-0.278***	-0.348	-1.124*	-0.034	1.230**	0.06		
	(0.000)	(0.022)	(0.011)	(0.175)	(0.082)	(0.242)	(0.002)	(0.859)	(0.018)			
Australia	-11.63*	-0.131*	-0.351*	1.257*	-0.075	-2.48**	-2.470**	-0.344	-0.534**	0.21		
	(0.000)	(0.003)	(0.001)	(0.006)	(0.618)	(0.036)	(0.040)	(0.651)	(0.033)			
Hong Kong	8.91*	0.114*	0.121***	-0.292**	-0.148*	-0.414	-0.627**	-0.411*	1.799*	0.13		
	(0.000)	(0.015)	(0.066)	(0.064)	(0.006)	(0.884)	(0.022)	(0.000)	(0.000)			

Note: The table presents OLS results with ROE as the dependent variable. The table presents the standard coefficient values (p-values in brackets) *, ** and *** indicate significance at 1%, 5% and 10% levels, respectively. Control variables, year dummies and industry dummies are also included and are available upon request.

Table 4.6 OLS Results with TQ as Dependent Variable

	Model 1						Model 2					
Countries	**Intercept**	**CCC**	**ACP**	**APP**	**ICP**	**Adj. R^2**	**Intercept**	**NIDs**	**ACM**	**BAA**	**EC**	**Adj. R^2**
United States	1.51*	-0.214*	0.491*	-0.180***	-0.001	0.17	-7.277	-1.315*	-0.151	-0.049	0.197*	0.16
	(0.000)	(0.000)	(0.000)	(0.087)	(0.432)		(0.746)	(0.000)	(0.225)	(0.679)	(0.001)	
Canada	1.60*	-0.140	-0.172	0.113	-0.180***	0.29	2.895	0.035	0.012	-0.49*	0.127	0.19
	(0.000)	(0.194)	(0.116)	(0.208)	(0.078)		(0.103)	(0.157)	(0.622)	(0.003)	(0.160)	
United Kingdom	2.06*	-0.103	0.097**	-0.142***	-0.063	0.09	-5.753*	-0.224	-0.131	1.780*	0.171*	0.09
	(0.000)	(0.110)	(0.023)	(0.074)	(0.293)		(0.000)	(0.454)	(0.354)	(0.001)	(0.003)	
France	2.39*	0.041	-0.009	-0.531	-0.028	0.41	3.572	-0.120	-0.001	-0.216	0.092	0.11
	(0.000)	(0.595)	(0.206)	(0.323)	(0.255)		(0.259)	(0.269)	(0.988)	(0.751)	(0.375)	
Australia	1.432*	-0.010	0.203	0.118**	-0.010	0.15	-36.615*	-0.113	-0.104	0.151**	3.450	0.41
	(0.000)	(0.375)	(0.853)	(0.042)	(0.329)		(0.002)	(0.182)	(0.248)	(0.011)	(0.399)	
Hong Kong	2.09*	-0.154	0.207	-0.087	-0.277	0.09	7.980*	-0.916**	0.037	-1.968*	0.073***	0.08
	(0.001)	(0.570)	(0.749)	(0.160)	(0.791)		(0.000)	(0.022)	(0.100)	(0.000)	(0.068)	
					Model 3							
	Intercept	**CCC**	**ACP**	**APP**	**ICP**	**NIDs**	**ACM**	**BAA**	**EC**	**Adj. R^2**		
United States	-0.866*	-0.220*	0.270*	-0.235*	0.020	-1.014*	-0.002	0.121*	0.167*	0.17		
	(0.000)	(0.000)	(0.000)	(0.002)	(0.740)	(0.000)	(0.842)	(0.000)	(0.002)			
Canada	11.22*	-0.003	-0.165	0.0578	-0.206***	0.030	0.0163	-0.484*	0.129**	0.23		
	(0.000)	(0.554)	(0.311)	(0.608)	(0.070)	(0.234)	(0.495)	(0.000)	(0.042)			
United Kingdom	-0.904	0.006	0.126**	-0.040	-0.084	-0.222	-0.151	0.368*	1.13*	0.09		
	(0.491)	(0.529)	(0.052)	(0.714)	(0.355)	(0.216)	(0.339)	(0.007)	(0.000)			
France	1.82*	-0.314**	-0.114**	-0.501**	-0.002	-0.115	-0.392**	-0.005	0.051	0.15		
	(0.000)	(0.046)	(0.015)	(0.023)	(0.281)	(0.381)	(0.049)	(0.633)	(0.337)			
Australia	-14.95*	0.147	-0.426*	2.173*	-0.406*	-1.172*	-0.539**	3.118	0.447**	0.71		
	(0.000)	(0.219)	(0.000)	(0.000)	(0.005)	(0.003)	(0.056)	(0.190)	(0.045)			
Hong Kong	10.64*	0.465*	0.152*	0.338*	0.069	-0.112	0.142	-2.767*	0.130*	0.15		
	(0.000)	(0.000)	(0.004)	(0.006)	(0.375)	(0.595)	(0.209)	(0.000)	(0.000)			

Note: The table presents OLS results with TQ as the dependent variable. The table presents standard coefficient values (p-values in brackets) *, ** and *** indicate significance at 1%, 5% and 10% levels, respectively. Control variables, year dummies and industry dummies are also included and are available upon request.

4.3.3 Fixed-Effect Results

The OLS estimation controls the individual specific effects by dumping them into an error term. According to Baltagi (2008) and Sila et al. (2016), time-invariant firm characteristics, such as corporate culture and managerial ability, tend to change with the passage of time on the basis of transformations in economic and financing conditions. Therefore, FE estimation addresses this problem by controlling the individual firm specific effects.

Hence, FE estimation is applied in this study in order to measure the impact of WCM and CG on FP, for the six developed markets. Tables 4.6, 4.7 and report the results of FE with ROA, ROE, and TQ as dependent variables, respectively. The results produced by FE effect are quite similar to those presented by the OLS technique.

Table 4.7 shows that the CCC coefficient is negative and significant at the 1% level with ROA, for all markets except Australia. These results are consistent with prior WCM related studies (Deloof, 2003; Enqvist et al., 2014; Juan García-Teruel & Martinez-Solano, 2007; Lazaridis & Tryfonidis, 2006b; Tingbani, 2015), which also report negative and significant relationships for Belgium, Greece, Spain, Finland and the UK, respectively. In the case of Australia, the negative insignificant relationship is consistent with Muscettola (2014) findings for Italy.

In the case of ACP and APP, Table 4.7 shows significant results at the 5% level for all markets and weak or negative relationships in the case of ICP. Tables 4.8 and 4.9 report the relationship with ROE and TQ as dependent variables. The results with ROE are quite similar to ROA. However, TQ exhibits a significant but weak relationship at the 10% level.

Furthermore, the interaction term has been included in order to determine the relationship among the variables. The untabulated results show that there is no significant relationship among variables with the interaction term.

Table 4.7 Fixed-Effect Results - ROA as Dependent Variable

		Model 1						Model 2				
Countries	**Intercept**	**CCC**	**ACP**	**APP**	**ICP**	**Adj. R^2**	**Intercept**	**NID**	**ACM**	**BAA**	**EC**	**Adj. R^2**
United States	2.48*	-0.203*	-0.148**	0.078	-0.172**	0.41	-20.52*	-0.317*	-0.016	0.425*	1.387*	0.48
	(0.000)	(0.000)	(0.044)	(0.165)	(0.042)		(0.000)	(0.000)	(0.787)	(0.003)	(0.000)	
Canada	23.33*	-0.141*	-0.021	-0.893**	-0.040	0.17	8.04*	0.713**	0.037	-0.143*	-0.137*	0.41
	(0.001)	(0.972)	(0.835)	(0.041)	(0.710)		(0.005)	(0.020)	(0.873)	(0.003)	(0.001)	
United	8.37*	-0.400*	-0.369*	0.368	-0.759	0.36	-20.72*	-0.365*	-0.350**	0.421*	2.638*	0.42
Kingdom	(0.000)	(0.008)	(0.004)	(0.199)	(0.116)		(0.000)	(0.001)	(0.020)	(0.000)	(0.000)	
France	2.20*	-0.173*	-0.040	-0.397**	-0.759	0.34	25.56*	-0.333**	-0.107*	-0.049	2.920**	0.53
	(0.000)	(0.008)	(0.426)	(0.020)	(0.116)		(0.000)	(0.043)	(0.002)	(0.517)	(0.042)	
Australia	3.01*	-0.019	0.216	0.128**	-0.035	0.58	-25.49*	-1.845*	-1.928**	0.057	6.826*	0.47
	(0.006)	(0.652)	(0.118)	(0.048)	(0.510)		(0.000)	(0.000)	(0.023)	(0.245)	(0.003)	
Hong Kong	6.20*	-0.191*	0.510	0.087	-0.119*	0.57	-18.29*	-1.011*	-0.075	-0.123*	0.893**	0.54
	(0.000)	(0.003)	(0.446)	(0.623)	(0.001)		(0.008)	(0.000)	(0.684)	(0.001)	(0.047)	
					Model 3							
	Intercept	**CCC**	**ACP**	**APP**	**ICP**	**NID**	**ACM**	**BAA**	**EC**	**Adj. R^2**		
United States	3.60*	-0.149*	-0. 101**	0.005	-0.381**	-0.349*	-0.019	0.529***	1.811*	0.28		
	(0.000)	(0.001)	(0.025)	(0.279)	(0.024)	(0.002)	(0.486)	(0.061)	(0.004)			
Canada	-8.41*	-0.021**	0.098	-0.259***	-0.033	0.336*	1.068**	0.163	-0.159**	0.53		
	(0.000)	(0.027)	(0.525)	(0.086)	(0.876)	(0.005)	(0.019)	(0.359)	(0.017)			
United	-5.50*	-0.109	0.381**	0.135	-0.381**	-0.184*	-0.070	1.780**	1.811*	0.39		
Kingdom	(0.000)	(0.316)	(0.048)	(0.432)	(0.024)	(0.000)	(0.720)	(0.029)	(0.004)			
France	1.96*	-0.298**	-0.826	0.614**	0.049	-0.403**	0.406**	-0.877	0.292*	0.43		
	(0.000)	(0.015)	(0.984)	(0.017)	(0.897)	(0.047)	(0.036)	(0.397)	(0.001)			
Australia	-31.72*	-0.054	0.110**	0.419*	-0.296	-1.666*	-1.923**	-0.251	2.151**	0.57		
	(0.000)	(0.924)	(0.013)	(0.005)	(0.191)	(0.004)	(0.043)	(0.463)	(0.023)			
Hong Kong	2.30*	-0.036	0.138***	-0.041	-0.316**	-0.902*	-0.365	-0.214**	0.758**	0.27		
	(0.000)	(0.958)	(0.072)	(0.738)	(0.014)	(0.003)	(0.834)	(0.014)	(0.033)			

Note: The table presents Fixed Effect results with ROA as the dependent variable. The standard coefficient values (p-values in brackets) *, ** and *** show significance at 1%, 5% and 10% levels, respectively. Control variables, year dummies and industry dummies are also included and are available upon request.

Table 4.8 Fixed Effect Results with ROE as Dependent Variable

	Model 1						Model 2					
Countries	**Intercept**	**CCC**	**ACP**	**APP**	**ICP**	**Adj. R^2**	**Intercept**	**NIDs**	**ACM**	**BAA**	**EC**	**Adj. R^2**
United States	3.54*	-0.123*	-0.135**	0.009	0.085	0.35	-21.86*	-0.325*	-0.093	0.321*	1.592*	0.54
	(0.000)	(0.004)	(0.025)	(0.633)	(0.338)		(0.000)	(0.004)	(0.911)	(0.001)	(0.000)	
Canada	42.36*	-0.250**	0.069	-0.143	-0.423	0.29	3.10*	2.213***	0.441	-0.665*	-0.536**	0.37
	(0.003)	(0.019)	(0.771)	(0.751)	(0.163)		(0.005)	(0.060)	(0.489)	(0.000)	(0.020)	
United Kingdom	5.40*	-0.400*	0.121**	0.028	-0.128	0.37	-20.91*	-0.72*	-0.176**	0.563	0.168**	0.19
	(0.000)	(0.000)	(0.049)	(0.795)	(0.222)		(0.000)	(0.007)	(0.030)	(0.471)	(0.018)	
France	2.28*	-0.569*	-0.283	-0.280**	-0.746	0.22	4.59*	-0.398**	-0.245*	-0.099	1.650**	0.39
	(0.000)	(0.005)	(0.509)	(0.021)	(0.114)		(0.000)	(0.027)	(0.004)	(0.697)	(0.030)	
Australia	1.815*	-0.016	0.483**	0.569**	-0.010	0.44	-28.44*	-1.134*	-1.273**	1.753	2.570*	0.34
	(0.000)	(0.824)	(0.042)	(0.020)	(0.937)		(0.000)	(0.004)	(0.020)	(0.339)	(0.007)	
Hong Kong	11.80*	-0.423*	0.140	0.068	-0.149*	0.49	6.28*	-0.334*	-0.372	-1.440**	0.102***	0.41
	(0.000)	(0.000)	(0.120)	(0.528)	(0.004)		(0.000)	(0.007)	(0.197)	(0.042)	(0.065)	
	Model 3											
	Intercept	**CCC**	**ACP**	**APP**	**ICP**	**NIDs**	**ACM**	**BAA**	**EC**	**Adj. R^2**		
United States	2.08*	-0.110**	-0.859**	-0.027	-0.501**	-0.240**	0.041	0.335	0.735*	0.14		
	(0.000)	(0.015)	(0.030)	(0.677)	(0.032)	(0.039)	(0.911)	(0.409)	(0.000)			
Canada	-8.57*	0.191	0.276	0.011	0.028	-0.534	2.638**	0.607	-0.521	0.3		
	(0.000)	(0.693)	(0.469)	(0.893)	(0.590)	(0.252)	(0.019)	(0.170)	(0.712)			
United Kingdom	-9.34*	-0.001	0.419**	0.119	-0.011	-0.752	1.756	0.133**	0.154**	0.26		
	(0.000)	(0.839)	(0.039)	(0.573)	(0.997)	(0.550)	(0.223)	(0.041)	(0.035)			
France	3.24*	-0.587**	0.331	0.135**	-0.868	-0.45**	0.364	0.525	0.601	0.37		
	(0.000)	(0.012)	(0.520)	(0.020)	(0.120)	(0.020)	(0.111)	(0.600)	(0.591)			
Australia	-19.22*	-0.026	-0.046	0.683	-0.370	-1.101	-0.52***	-0.466	1.330**	0.39		
	(0.000)	(0.947)	(0.356)	(0.970)	(0.481)	(0.404)	(0.072)	(0.816)	(0.041)			
Hong Kong	3.64*	-0.075	0.258**	-0.013	-0.215	-0.106*	-0.230	-0.023**	0.198*	0.12		
	(0.000)	(0.434)	(0.015)	(0.417)	(0.786)	(0.008)	(0.352)	(0.043)	(0.000)			

Note: The table presents Fixed Effect results with ROE as the dependent variable. The table presents standard coefficient values (p-values in brackets) *, ** and *** show significance at 1%, 5% and 10% levels, respectively. Control variables, year dummies and industry dummies are also included and are available upon request.

Table 4.9 Fixed Effect Results with TQ as Dependent Variable

		Model 1						Model 2				
Countries	**Intercept**	**CCC**	**ACP**	**APP**	**ICP**	**Adj. R^2**	**Intercept**	**NIDs**	**ACM**	**BAA**	**EC**	**Adj. R^2**
United States	0.414**	-0.314*	-0.131**	0.044	0.199**	0.14	-5.41*	-0.518**	0.099	0.014	0.203*	0.39
	(0.035)	(0.001)	(0.046)	(0.574)	(0.015)		(0.000)	(0.018)	(0.439)	(0.211)	(0.007)	
Canada	2.52***	0.020	0.111	-0.011	0.002	0.38	-4.63	0.299	0.413**	0.726	0.040	0.13
	(0.072)	(0.900)	(0.652)	(0.686)	(0.214)		(0. 241)	(0.384)	(0.034)	(0.364)	(0.538)	
United	1.93*	-0.107	0.337**	0.153	-0.111	0.42	-4.93*	0.413**	0.364**	1.194	0.396*	0.18
Kingdom	(0.000)	(0.262)	(0.019)	(0.198)	(0.325)		(0.000)	(0.013)	(0.021)	(0.118)	(0.000)	
France	0.982	-0.017	-0.035	-0.555	-0.134	0.3	5.66***	0.028	0.025	-0.012	0.706**	0.1
	(0.124)	(0.858)	(0.563)	(0.874)	(0.635)		(0.054)	(0.171)	(0.192)	(0.201)	(0.027)	
Australia	2.32**	-0.092	0.463**	0.346**	-0.359	0.43	-25.93**	-1.102***	-0.065	0.104***	0.161	0.39
	(0.016)	(0.959)	(0.049)	(0.038)	(0.177)		(0.045)	(0.066)	(0.311)	(0.081)	(0.567)	
Hong Kong	1.80*	-0.154**	-0.007	-0.009	-0.023	0.24	3.55**	-0.629*	-0.259	-2.84*	0.025	0.14
	(0.000)	(0.022)	(0.858)	(0.515)	(0.649)		(0.027)	(0.005)	(0.113)	(0.002)	(0.698)	
					Model 3							
	Intercept	**CCC**	**ACP**	**APP**	**ICP**	**NIDs**	**ACM**	**BAA**	**EC**	**Adj. R^2**		
United States	-2.64*	-0.141**	-0.063*	0.006	0.040	-0.060*	0.002	0.104*	0.108**	0.07		
	(0.000)	(0.027)	(0.002)	(0.941)	(0.371)	(0.000)	(0.822)	(0.000)	(0.038)			
Canada	-2.85***	-0.004	0.021	-0.061	0.745**	0.141	0.068	0.489	0.060	0.29		
	(0.089)	(0.610)	(0.882)	(0.851)	(0.049)	(0.764)	(0.983)	(0.713)	(0.656)			
United	-10.49**	-0.112	0.417**	-0.088	-0.584*	0.341***	0.250	1.898**	0.351*	0.16		
Kingdom	(0.004)	(0.282)	(0.019)	(0.582)	(0.000)	(0.075)	(0.167)	(0.036)	(0.000)			
France	1.14	-0.022	0.064	0.036	-0.261	0.321**	-0.123	0.246	-0.014	0.19		
	(0.334)	(0.493)	(0.990)	(0.273)	(0.598)	(0.016)	(0.410)	(0.723)	(0.850)			
Australia	-15.04*	0.294	0.015	0.892	-	-1.172*	-0.802***	0.206*	0.424**	0.64		
	(0.006)	(0.600)	(0.329)	(0.387)	1.678***	(0.003)	(0.090)	(0.001)	(0.034)			
					(0.063)							
Hong Kong	-1.62	0.062	0.270*	-0.022	-0.052	-0.103**	-0.249	-0.049	0.531*	0.13		
	(0.159)	(0.501)	(0.009)	(0.165)	(0.501)	(0.010)	(0.287)	(0.000)	(0.000)			

Note: The table presents Fixed Effect results with TQ's as the dependent variable. The table presents standard coefficient values (p-values in brackets) *, ** and *** show significance at 1%, 5% and 10% levels, respectively. Control variables, year dummies and industry dummies are also included and are available upon request.

4.4 Advanced Diagnostics Test

The unit root test and the Pearson pairwise correlation test have been used as a basic diagnostics tests to check for stationarity and multicollinearity in the data (Baltagi, 2008; Gujarati, 2008). Another two important assumptions of the CLRM are heteroscedasticity and serial correlation in data. The error term should be constant across time and cross sections. The violation of this assumption would lead to heteroscedasticity in the data (Gujarati, 2012).

Heteroscedasticity occurs due to non-constant variance in error. It arises when there is a number of X variables in the panel data. According to Greene (2000), this is due to each observation being based on the average of a group and differing group sizes. Baltagi (2008) suggests testing the model for heteroscedasticity and for correlation. For serial correlation in data, the error term should not be correlated with past values. This violation will lead to serial correlation in the data.

Therefore, the Breusch-Pagan test was used to test for heteroscedasticity in the models. The Wooldridge (2002) test for autocorrelation was also employed to test for serial correlation. The presence of serial correlation violates the assumption of CLRM (Anderson, Sweeney, Williams, Camm, & Cochran, 2014) and this means that OLS or FE will no longer be the Best Linear Unbiased Estimator (BLUE). The next section reports and discusses the results of these tests.

4.4.1 The Breusch-Pagan/Cook-Weisberg Test for Heteroscedasticity

According to Baltagi (2008), the variance of the error term must be coherent over time and cross sections, or disturbances are homoscedastic. This means the error term (μ_i) is equal to a constant number (σ^2) and can be written as:

$$E(\mu 2i) = \sigma^2 \qquad where\ i = 1, 2, 3 \ldots\ldots n \qquad (4.3)$$

According to Gujarati (2012), heteroscedasticity can be due to a number of reasons; for example, the behaviour of people, outliers, the number of variables (too many or too few), incorrect log transformation, and mixing observations with different measure of scales. The data set of this study consists of varying sized firms (both small and large firms). Due to their

varying sizes, some outliers may be present in the data set. Hence, there is a possibility of heteroscedasticity in the data set (Gujarati (2012). We ran the Breusch-Pagan test, as the test has the ability to address the correct identification of Y variables. The Breusch-Pagan test can be expressed as:

$$FPi = \beta_0 + \beta_1 Y_{1i} + \beta_2 Y_{2i} + \beta_3 Y_{3i} + \ldots + \beta_n Y_{ni} + \upsilon_i \quad (4.4)$$

Where FP is firm performance, Y is independent variables, and the error term is given as:

$$\sigma^2 = f(\alpha_1 Z_1 + \alpha_2 Z_2 + \ldots\ldots\ldots\ldots + \alpha_n Z_n) \quad (4.5)$$

The null hypothesis of the Breusch-Pagan test is that the data is homoscedastic. Table 4.10 presents the results of the Breusch-Pagan test for Models 1, 2 and 3 with ROA, ROE and TQ's as the dependent variable for all six markets. The p-value shows that the null hypothesis can be rejected in all six markets, which means that the error term is not constant, or there is heteroscedasticity in our data. In light of Johnston and DiNardo's (1972, pp. 402–403) argument that, "if the null hypothesis is rejected then FE model is still valid and has consistent estimates but is no longer efficient." Similarly, Baltagi (2008)and Gujarati (2012) are of the same view that rejection of the null hypothesis leads to consistent but inefficient estimates while using FE.

Table 4.10 The Breusch-Pagan/Cook-Weisberg Test for Heteroscedasticity

	Model 1	Model 2	Model 3
		ROA	
United States	890.23*	588.93*	759.77*
	(0.0000)	(0.0000)	(0.0000)
Canada	372.21*	313.90*	287.70*
	(0.0000)	(0.0000)	(0.0000)
The United Kingdom	87.89*	55.81*	109.21*
	(0.0000)	(0.0000)	(0.0000)
France	71.25*	130.52*	97.79*
	(0.0000)	(0.0000)	(0.0000)
Australia	284.66*	54.12*	308.15*
	(0.0000)	(0.0000)	(0.0000)
Hong Kong	235.39*	92.81*	226.17*
	(0.0000)	(0.0000)	(0.0000)
		ROE	
United States	35.39*	59.33*	113.02*
	(0.0000)	(0.0000)	(0.0000)
Canada	79.04*	150.99*	79.65*
	(0.0000)	(0.0000)	(0.0000)
The United Kingdom	77.21*	165.32*	103.74*
	(0.0000)	(0.0000)	(0.0000)
France	101.78*	43.90*	82.98*
	(0.0000)	(0.0000)	(0.0000)
Australia	108.76*	183.50*	134.84*
	(0.0000)	(0.0000)	(0.0000)
Hong Kong	264.64*	391.96*	424.15*
	(0.0000)	(0.0000)	(0.0000)
		TQ	
United States	68.28*	109.34*	95.49*
	(0.0000)	(0.0000)	(0.0000)
Canada	439.42*	107.10*	355.97*
	(0.0000)	(0.0000)	(0.0000)
The United Kingdom	76.93*	68.77*	124.92*
	(0.0000)	(0.0000)	(0.0000)
France	402.93*	164.07*	4786.58*
	(0.0000)	(0.0000)	(0.0000)
Australia	325.82*	226.45*	361.66*
	(0.0000)	(0.0000)	(0.0000)
Hong Kong	1186.28*	3179.79*	3975.67*
	(0.0000)	(0.0000)	(0.0000)

Note: The table presents the Breusch-Pagan test with ROA, ROE and TQ, p-value in parenthesis. * indicates significance at 1%.

4.4.2 Wooldridge Test for Autocorrelation

Another important assumption of CLRM is to check for autocorrelation in the error term. This implies that the error term of one particular observation is not affected by the error term of another observation. According to Baltagi (2008), the presence of autocorrelation will produce consistent, but inefficient, results for linear panel models. Various tests are used for detecting autocorrelation in panel data, including the Durbin-Watson, the Breusch-Godfrey, and the Baltagi-Wu tests.

Drukker (2003) argues that these tests are not appropriate for panel data due to various assumptions, such as presence of heteroscedasticity, individual effects and the independent variables with non-stochastic effects. Drukker suggests that the Wooldridge (2002) test is an appropriate test for unbalanced panel data (with or without gaps), since such limitations do not exist in the Wooldridge (2002) test. It is appropriate for this study as it includes unbalanced panel data. This test was run with Stata version 13 software using "xtserial" command. The null hypothesis is that there is no autocorrelation in the data.

Appendix A presents the Wooldridge (2002) autocorrelation test results for all six markets, with ROA, ROE and TQ's. The results are significant at the 1% level. Hence, the null hypothesis can be rejected. This implies the presence of autocorrelation in the data.

4.5 OLS & Fixed Effects Results Reliability

In the context of the reliability of our OLS & FE results, the presence of autocorrelation and heteroscedasticity in our data generates consistent, but inefficient, OLS estimates (Baltagi, 2008). This is because the standard errors are downward biased and the CLRM assumes the disturbance term as constant. In the case of FE estimation, it is assumed that the disturbance term is identically spread and independent of the disturbance term. Here the question arises, what is the best possible solution (technique) for investigating the relationship between WCM-FP and CG-FP?

According to Gujarati (2012), the best solution to address the problem of heteroscedasticity in the data is to allocate weights to every observation of the population. Observations with less variability should be assigned more weight, and less weight should be assigned to observations with greater variability. Generalised Least Squares (GLS) can address the problem of heteroscedasticity by assigning weights to the observations in data, which is not possible with simple OLS and FE methods. The autocorrelation issue can be addressed in

several ways, such as using lags of dependent variables, taking logarithms and adding extra independent variables (Baltagi, 2008; Gujarati, 2012).

The possibility of endogeneity has been largely ignored in the literature. Most prior studies have considered the one way impact of WCM-FP and CG-FP, but there is a possibility that WCM-CG components may be affected by the prior year firm's performance. According to Wintoki et al. (2012), endogeneity exists when OLS and FE methods do not provide BLUE results. Gujarati (2012) suggests using Dynamic Panel Data (DPD) in such cases. To best of our knowledge, most of existing studies have ignored the dynamic nature of the WCM-CG relationship and FP. The next chapter explores whether a dynamic relationship exists between WCM-CG and firms performance.

4.6 Chapter Summary

This has chapter reported the empirical results of OLS and FE estimations. The discussions have included descriptive statistics, OLS and fixed-effect results, along with diagnostic tests, such as the unit root test, the Pearson pairwise correlation, the variance inflation factor test, the Breusch-pagan test, and the Wooldridge test.

The descriptive statistics were reported in Table 4.1. Table 4.1 demonstrates that the mean value for CCC varies from 43.00 days to 303.50 days, with an overall mean of 106.09 CCC days. Canada exhibits the lowest number of CCC days, while Hong Kong exhibits the highest number of CCC days. This implies that Canadian firms are more efficient in terms of CCC than the rest of the developed markets. The average mean value for accounts receivable collection varies from 45.00 to 154.79 days for the six developed markets, with an overall mean value of 74.57 days. The result shows that the US is the most efficient market in collecting its credit sales, with an average of 45 days, compared to Australia which is the least efficient with an average collection period of 154.79 days. The average mean value of payment period varies from 62.01 to 95.19 days, with an overall mean of 76.35 days. The result shows that the UK is the most efficient market, with an average of 95.19 day delay in making payment to creditors, followed by the US with 62.01 days. The result is consistent with Tingbani (2015) study of the UK (96 accounts payable turnover days). The average mean value of inventory conversion period varies from 59.08 to 101.98 days, with an overall mean value of 76.72 days, showing variations in terms of the inventory holding period. The UK holds inventory for a longer time period compared to the other five developed markets.

Table 4.1 also reports the descriptive statistics of CG components. In terms of the number of independent directors, the US exhibits the highest number (8.41), while Hong Kong exhibits the lowest number (3.57). The mean value for audit committee meetings varies from 3.07 to 7.90, with an overall mean value of 4.72 meetings. The US exhibits an average of 8 audit committee meetings in a year, while Hong Kong exhibits 3 meetings in a year. In terms of the board average age of members, the US has oldest on average (62.02 years), while Hong Kong has the youngest on average (55.08 years). Similarly, the executive compensation mean value varies from $14.75 to $17.02, with an overall mean value of $15.76. The US exhibits the highest number of executive compensation ($17.02) whereas, France exhibits the lowest number ($14.75) among the six developed markets in this study.

In terms of the multiple regression results, several diagnostics tests have been conducted to check the validity of the data. For OLS estimates, an ideal condition needs to be fulfilled (the best linear unbiased estimator or BLUE). There are various basic and advanced diagnostic tests for checking the assumptions for BLUE. First, the Fisher –Type p test and the Modified Fisher-type p test was applied to check for data stationarity. The p-values with all the dependent variables (ROA, ROE, and TQ) reject the null hypothesis for all six developed markets. This means there was no stationarity problem in our data. Secondly, the Pearson pairwise correlation test shows the correlation among our models variables is below 0.80, which means there was no multicollinearity in the data. Furthermore, the variance inflation factor test value was 2.21 which also indicates that there was no issue of multicollinearity. In light of prior studies, the study also started with traditional OLS followed by fixed-effect methods, as suggested by Hausman's test. The OLS results are significant with our main variable (ROA) at/or less than 10% in all markets. The other two performance measurement variables (ROE and TQ) were used to test the results' robustness. ROE had similar results to ROA, however, mixed results were produced for TQ.

The FE results were quite similar to our OLS estimations. The results are significant at 10% level with ROA. On the basis of alternative measures of dependent variable; the robustness test shows the results obtained through fixed-effects are significant with ROE, but insignificant with TQ. The advance level tests, such as the Bruesch-Pagan and the Wooldridge test for heteroscedasticity and autocorrelation were applied respectively. The tests rejected the null hypothesis and confirmed the issue of heteroscedasticity and autocorrelation in our

data.

Baltagi (2008) argue that the presence of heteroscedasticity and autocorrelation will produce consistent results with the OLS and FE estimations. But these results would be inefficient. There are various ways through which heteroscedasticity can be managed. These include the use of GLS, log transformation or first difference. Similarly, to address the autocorrelation in our data, Baltagi (2008) and Gujarati (2012) suggest a lagged dependent variable may be included, adding additional independent variables, and taking log transformation.

Finally, the results obtained using OLS and FE estimation techniques are not Best Linear Unbiased Estimator (BLUE). Wintoki et al. (2012) suggest that non-BLUE results may be due to existence of endogeneity. Existing literature on WCM and CG has only considered their impact on FP by ignoring the relationship other ways.[8] However, this study expects the presence of endogeneity. Based on Gujarati (2012), a dynamic relationship is tested using the Dynamic Panel Model estimation technique (the Generalized Method of Moments -GMM) is discussed in the next chapter. This study uses the estimation technique (SGMM) while analysing the relationship between the WCM, CG and firm performance. The GMM technique is a superlative form of a fixed effect enable us to control for the unobserved heterogeneity in error term (Gormley & Matsa, 2013).

[8]Other way means simultaneity (that is, examining whether firm performance can also effect WCM and CG).

Chapter 5
Dynamic Panel Data Estimation Results

5.1 Introduction

This chapter presents empirical insights about the impact of WCM and CG on firm performance, based on the dynamic nature relationship between them (research objective 1 as presented in section 1.4). Section 5.2 provides evidence for this dynamic relationship. Section 5.3 discusses the comparison between OLS, fixed-effect, and dynamic models. Section 5.4 identifies significant lags required for the dynamic relationship. Section 5.5 explains justification of the dynamic panel data estimation technique (GMM). Section 5.6 outlines the dynamic models and results. Section 5.7 provides an overview of the various diagnostics tests for the GMM system. Section 5.8 explores the role of WCM and CG during the global financial crisis of 2008. Section 5.9 summarises the chapter.

5.2 Dynamic Relationship – WCM & CG

This section presents the theoretical and empirical evidence to support the argument that the relationship between WCM-FP and CG-FP is dynamic.

5.2.1 Theoretical Evidence

The literature review in Chapter 2 revealed that the relationship between WCM-FP is investigated on the basis of its components, such as cash conversion cycle, average collection period, average payment period, and inventory conversion period on FP. Similarly, studies on CG investigated the impact of its components, such as the number of independent directors, board age, women on boards, executive compensation, external directors, board size and salary structure on FP. Myers and Majluf (1984) argue that firms use pecking order theory (see section 1.2) to create their internal funds. According to Ross, Westerfield, and Jordan (2008), the main source of a firm's internal funds is profit. In addition, debt and equity financing help to meet day-to-day operating costs. WC's sole function is to provide finance for these costs (Ross, Westerfield, & Jaffe, 2002) and also help firms to make governance decisions (Abor, 2007). When firms make WCM and CG decisions they consider profit levels. The literature review revealed that most of the existing studies have ignored the possibility of endogeneity. Earlier studies have considered the relationship as a unidirectional relationship. This implies that only WCM and CG components affect firm performance, not the other way around. However, some prior studies have examined the bidirectional

relationship between CG determinants and FP for specific markets (Adams & Ferreira, 2009; Chang, Fu, Low, & Zhang, 2015; Hermalin & Weisbach, 1988; Wintoki et al., 2012). This study explores the two-way relationship between WCM, CG and FP, known as simultaneity, for six developed markets. According to Baltagi (2008) and Gujarati (2012), if the relationship between WCM, CG and FP is assumed to be two-way, then the OLS or fixed-effect due to the simultaneity problem, will produce biased results because of endogeneity (Nadeem et al., 2017a) .

5.2.2 Empirical Models

Gujarati (2012) suggests various ways to check the static or dynamic nature of the model, using a lagged dependent variable. We need to check whether a lagged dependent variable can also be a regressor. If the results appear to be significant, then the model is dynamic and should be assessed using dynamic panel models. The linear model equations, including the lagged dependent variables are given as follow:

For WCM

$$FP_{it} = \alpha + FP_{it-1} + \varphi\beta_1 WCM_{it} + \phi\beta_2 X_{it} + \eta_i + e_{it} \quad (5.1)$$

For CG

$$FP_{it} = \alpha + FP_{it-1} + \varphi\beta_1 CG_{it} + \phi\beta_2 X_{it} + \eta_i + e_{it} \quad (5.2)$$

Where FP is firm performance measured by ROA, ROE, and TQ, FPit-1 is the dependent variable with lagged value, WCM_{it} and CG_{it} represents components of working capital management (CCC, ACP,APP and ICP) and corporate governance (NID, ACM, BAA, EC), η_i and e_{it} are unobserved firm specific effect and error term for firm i at time t, respectively.

5.2.2.1 Dynamic Estimation (OLS)

The Stock Watson dynamic OLS estimation is preferred over the OLS and maximum likelihood estimation, since it tackles the problem of simultaneity (Masih & Masih, 1996). The dynamic OLS is applied to equation (5.1), in order to test the significance of the lagged dependent variable (Wintoki et al., 2012). Wintoki et al. (2012) explain that an increase in the Adj. R^2 in dynamic OLS, compared to traditional (static) OLS, clearly indicates a dynamic relationship. Table 5.1 shows the dynamic OLS results with ROA, ROE, and TQ as the dependent variable, respectively. The results show a significant increase in Adj. R^2 of the dynamic OLS, compared to the static OLS. The average increase in ROA is 64% for Model 1

and 49% for Model 2. In terms of ROE, the average increase is 53% for Model 1 and 41% for Model 2. Similarly, TQ increases to 46% and 52% for Model 1 and Model 2, respectively.

Besides an increase in Adj. R^2, the lagged dependent variables coefficients are significant at 1% for all six developed markets. This supports the argument for the existence of a dynamic relationship.

Table 5.1 Dynamic OLS Results with ROA, ROE, and TQ

	Model 1 (WCM)		Model 2 (CG)	
	Lagged D.V. (ΔAdj-R^2)	**Adj-R^2**	**Lagged D.V.** (ΔAdj-R^2)	**Adj.R^2**
		ROA		
The United States	0.766*	0.65	0.548*	0.39
	(0.000)	(0.15)	(0.000)	(0.13)
Canada	0.534*	0.35	0.469*	0.32
	(0.000)	(0.19)	(0.000)	(0.09)
The United Kingdom	0.556*	0.40	0.583*	0.35
	(0.000)	(0.07)	(0.000)	(0.08)
France	0.490*	0.42	0.491*	0.47
	(0.000)	(0.23)	(0.000)	(0.24)
Australia	0.470*	0.24	0.492*	0.38
	(0.000)	(0.08)	(0.000)	(0.20)
Hong Kong	0.623*	0.46	0.576*	0.48
	(0.000)	(0.19)	(0.000)	(0.12)
		ROE		
The United States	0.817*	0.51	0.520*	0.25
	(0.000)	(0.03)	(0.000)	(0.05)
Canada	0.396*	0.29	0.399*	0.27
	(0.000)	(0.09)	(0.000)	(0.11)
The United Kingdom	0.509*	0.29	0.507*	0.34
	(0.000)	(0.03)	(0.000)	(0.06)
France	0.298*	0.33	0.274*	0.25
	(0.000)	(0.07)	(0.000)	(0.07)
Australia	0.418*	0.41	0.440*	0.29
	(0.000)	(0.07)	(0.000)	(0.11)
Hong Kong	0.590*	0.43	0.553*	0.38
	(0.000)	(0.24)	(0.000)	(0.11)
		TQ		
The United States	0.790*	0.70	0.863*	0.73
	(0.000)	(0.17)	(0.000)	(0.16)
Canada	0.771*	0.72	0.641*	0.67
	(0.000)	(0.29)	(0.000)	(0.19)
The United Kingdom	0.796*	0.68	0.789*	0.65
	(0.000)	(0.09)	(0.000)	(0.09)
France	0.886*	0.76	0.932*	0.74
	(0.000)	(0.41)	(0.000)	(0.11)
Australia	0.898*	0.75	0.996*	0.85
	(0.000)	(0.15)	(0.000)	(0.41)
Hong Kong	0.638*	0.29	0.691*	0.61
	(0.000)	(0.09)	(0.000)	(0.08)

Note: Standard coefficient values (p-values in brackets) * shows significance at the 1% level.

Source: Author's calculations

5.2.2.2 The Wooldridge Test for Strict Exogeneity

According to Wooldridge (2002) in fixed-effect estimation, the error term is independent of all explanatory variables. The violation of this assumption will produce inconsistent results. This is known as an endogeneity problem. This problem occurs due to unobserved heterogeneity (also known as omitted variables), measurement error, omitted selection, auto-regression with auto-correlated errors and simultaneity causality. It can be in both directions. Firstly, the error term and lagged values of the regressors are correlated. Secondly, the future values of the explanatory variables and error terms are correlated. The second situation arises due to a simultaneity problem. According to Wooldridge (2002, p 285), the easiest way to address the endogeneity problem (when the error term and lagged values of explanatory variables are correlated) is to include lags of regressors. However, in this study the problem was that the error terms were correlated with future values of WCM and CG (referred as exogeneity) and for this purpose Wooldridge (2002) recommends a test for strict exogeneity.

The null hypothesis for this test is that future values of WCM and CG components are not correlated with current FP. We applied fixed-effect estimation. Table 5.2 reports the results of the relationship between current FP and the future impact of WCM and CG by controlling the current WCM, CG and control variables (FS, SG and CR). Table 5.2 shows the future values of WCM and CG components are significant at 1% and 5%, respectively. This implies that the current FP in our model is significantly correlated with future values of one or more of the explanatory variables. Therefore, the null hypothesis can be rejected as it violates the strict exogeneity assumption. According to Wooldridge (2002), this leads to the use of dynamic model estimation technique, since the OLS and fixed-effect estimation technique will produce inconsistent results.

Table 5.2 The Wooldridge Test for Strict Exogeneity

Mkt	CCC (t)	CCC (t+1)	ACP (t)	ACP (t+1)	APP (t)	APP (t+1)	ICP (t)	ICP (t+1)	NID (t)	NID (t+1)	ACM (t)	ACM (t+1)	BAA (t)	BAA (t+1)	EC (t)	EC (t+1)
US	-0.513*	-0.299*	-0.031	-0.057	0.015	0.064	-0.051	-0.020	-0.304*	-0.753*	-0.296*	-0.705*	-0.253*	-0.773*	-0.317*	-0.756*
	(0.000)	(0.001)	(0.546)	(0.828)	(0.829)	(0.915)	(0.871)	(0.509)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.001)	(0.000)	(0.006)
CA	-0.534*	-0.453*	-0.213*	-0.367*	-0.070	0.063	-0.026	-0.034	-0.278*	-1.190*	-0.160*	-0.45**	-0.228*	-0.124*	-1.596*	-0.256*
	(0.000)	(0.000)	(0.002)	(0.000)	(0.497)	(0.371)	(0.392)	(0.477)	(0.000)	(0.000)	(0.002)	(0.021)	(0.000)	(0.008)	(0.000)	(0.003)
UK	-0.345*	-0.259*	-0.166*	-0.263*	0.765*	-0.338*	-2.93*	-1.973*	-0.557*	-0.881*	-0.476*	-1.96**	0.027*	-1.781*	-0.945*	-0.193*
	(0.000)	(0.004)	(0.002)	(0.000)	(0.006)	(0.000)	(0.003)	(0.000)	(0.009)	(0.000)	(0.002)	(0.040)	(0.002)	(0.000)	(0.003)	(0.000)
FR	-0.272*	-.119**	-.605**	-0.16**	0.254*	-0.689**	-0.010	-0.049	0.286*	-2.10**	-0.28**	-0.52**	-0.859	0.162	2.901*	2.169*
	(0.002)	(0.038)	(0.044)	(0.027)	(0.007)	(0.024)	(0.929)	(0.589)	(0.048)	(0.039)	(0.046)	(0.022)	(0.414)	(0.142)	(0.001)	(0.003)
AU	-0.023	-0.086	-0.010	-0.014	0.521*	0.329*	0.46**	0.230**	-0.065	1.119	1.899*	0.653	1.463*	0.332	0.293*	0.514*
	(0.346)	(0.637)	(0.273)	(0.910)	(0.000)	(0.002)	(0.029)	(0.30)	(0.992)	(0.161)	(0.000)	(0.264)	(0.004)	(0.648)	(0.003)	(0.002)
HK	-0.275*	-.811**	-0.259*	-0.32*	0.521*	0.625*	0.128*	-0.19**	-0.36**	-0.97*	0.195	-0.154	-0.158	-0.27*	0.453*	0.243*
	(0.001)	(0.025)	(0.004)	(0.000)	(0.031)	(0.007)	(0.000)	(0.019)	(0.041)	(0.008)	(0.399)	(0.483)	(0.372)	(0.004)	(0.000)	(0.000)

Note: The standard coefficient values (p-values in brackets) * and ** show significance at 1% and 5%, respectively. The t inside brackets represents current value and t+1 represents future value.

5.3 OLS and Fixed Effects versus Dynamic Models

The dynamic nature of WCM, CG and FP is confirmed by the results of dynamic OLS and the Wooldridge test for strict exogeneity presented in Tables 5.1 and 5.2. The next section discusses two possible problems that may arise due to the presence of endogeneity when using static OLS and FE estimation techniques. These problems are simultaneity and unobserved heterogeneity.

5.3.1 Simultaneity Problem

The simultaneity problem in equation (5.1) exists when Y $(e_{it}/FP_{it}, WCM_{it}) \neq 0$ and in equation (5.2) when Y $(e_{it}/FP_{it}, CG_{it}) \neq 0$.This means that not only WCM and CG affects FP, but that the reverse also holds. The discussion in sections 5.2.1 and 5.2.2 provide theoretical and empirical support of how WCM and CG depend on FP (simultaneity case). In this situation, traditional OLS and FE will produce biased and inconsistent results (Gujarati, 2012). This issue can be solved by using two separate equations for both WCM and CG, respectively. This is known as simultaneous equation modelling (SEM). Equations 5.1 and 5.2 measure the impact of WCM and CG on FP, while equations 5.3 and 5.4 measure the impact of FP on WCM and CG, respectively. SEM works on the assumption of strict exogenous instrument variables which are not part of the performance measurements. However, this assumption is difficult to fulfil (Wintoki et al., 2012).

5.3.2 Unobserved Heterogeneity Problem

Unobserved heterogeneity is the second source of endogeneity. This means there are some other variables than our explanatory variables, which may affect the FP, such as firm size, firm image, leverage, and debt ratio. According to Wintoki et al. (2012), the use of the FE technique on linear model can help to solve the fixed part of the unobserved heterogeneity. However, Baltagi (2008) argues that FE estimation will produce unbiased results when the current values of explanatory variables and past values of dependent variables have an independent relationship with each other. However, in our study the FE will produce biased and inconsistent results because the future value of WCM and CG components have a significant relationship with firms' past performance (see section 5.2.2.2).

The discussion in sections 5.1 and 5.2 highlights three important facts; (1) the dynamic nature of the relationship between WCM, CG and FP; (2) the lagged FP as an explanatory variable; and (3) the presence of simultaneity, which means that WCM, CG, and FP have a reverse causal relationship. In addition, Chapter 4 confirms the problem of autocorrelation and

heteroscedasticity in our dataset. However, the assumption in Chapter 4 regarding the dynamic relationship and endogeneity proved true (see sections 5.1 and 5.2). This creates the need for developing a model which not only addresses the issue of heteroscedasticity, autocorrelation, endogeneity (due primarily to simultaneity), but one which can also address the dynamic nature relationship. To remedy these issues, we developed the dynamic panel model with lagged values of dependent variables as regressors (Gujarati, 2012). The next important step was to determine the significant number of lags for FP, to capture the complete effect of past performance.

5.4 Significant Number of Lags for Firm Performance

A dynamic model is a statistical model which contains lagged dependent variables as regressors and estimated using dynamic estimation (Gujarati, 2012). This means the impact of past performance of the dependent variable should also be considered. An important question arises; how many lags of the dependent variables should be considered as regressors? According to Wintoki et al. (2012), the consideration of using a sufficient number of lags is important because too few lags may not capture the complete impact of the past on the present. This means equations 5.1 and 5.2 need modification. These lags can be used as instruments with a dynamic model. In order to determine the number of lags required for this study, current FP is regressed on past performance with ROA after controlling the components of WCM, CG and control variables, by estimating the following equations:

For WCM

$$FP_{it} = \alpha + \beta_1 LFP_{it-1} + \beta_2 WCM_{it} + \phi X_{it} + \eta_i + e_{it} \quad (5.3)$$

For CG

$$FP_{it} = \alpha + \beta_1 LFP_{it-1} + \beta_2 CG_{it} + \phi X_{it} + \eta_i + e_{it} \quad (5.4)$$

Where FP is firms performance, LFPit-1 is the dependent variable with lagged value, WCM_{it} and CG_{it} represents components of working capital management (CCC, ACP,APP, and ICP) and corporate governance (NID, BAA, ACM, and EC), η_i and e_{it} are unobserved firm specific effect and error term for firm i at time t, respectively.

In light of Wintoki et al. (2012), a dynamic OLS was applied to equations 5.3 and 5.4. Initially, two lags were included. The un-tabulated result indicated that all markets were significant at

the 1% level for two lags. Further, to identify the optimal instruments, deeper lags were considered. For this purpose, we dropped the first two significant lags and ran dynamic OLS for third and fourth lag. The results again showed significant results for these lags at 5% levels. This means these lags can be used to find the optimal instruments. The value of Adj. R^2 was also quite high which shows the goodness of fit. This was a good sign in light of Arellano and Bond (1991) argument that lags more than one can be helpful in identifying good instruments. However, in light of Wintoki et al. (2012), more lags can reduce the data set and caution is required. Hence, we assume that the required information can be traced by using most recent lag (first lag). Therefore, for dynamic estimation in this study, a first lag is considered as regressors and subsequent lags are used for IV instruments and the Generalised Method of Moments (GMM).

5.5 Dynamic Panel Model and Results

Wintoki et al. (2012) argue that OLS and FE estimation techniques will produce biased results in the presence of endogeneity because of two reasons; simultaneity and unobserved heterogeneity. Therefore, in order to investigate the dynamic relationship between WCM, CG and FP, the dynamic panel data (DPD) model is used to generate unbiased results. Equations 5.5 and 5.6presents the DPD model for WCM and CG, respectively.

For WCM

$$FP_{it} = \alpha + \beta_1 LFP_{it-1} + \beta_2 WCM_{it} + \beta_3 Control_{it} + T.\gamma + \eta_i + e_{it} \qquad (5.5)$$

For CG

$$FP_{it} = \alpha + \beta_1 LFP_{it-1} + \beta_2 CG_{it} + \beta_3 Control_{it} + T.\gamma + \eta_i + e_{it} \qquad (5.6)$$

To estimate these equations, we applied the Arrelano-Bond Generalised Method of moments (GMM).

5.5.1 Justifications for Generalised Method of Moments (Arrelano-Bond Estimator)

Hansen (1982) first introduced the Generalised Method of Movements (GMM) by studying the large sample properties of GMM estimators, which includes many standard economic estimators. Before that Maximum Likelihood Estimation (MLE) was considered to be the best estimation technique for statistical analysis. This technique was based on the concept of a joint probability distribution, but in some cases, it becomes a weakness due to the small

variance and asymptotically normal estimators. Two problems exist in MLE: (1) computational burden; and (2) sensitivity of statistical properties to distribution. These led to the use of GMM (Hall, 2005). GMM has been used across various field of studies at different point of time (see Table 5.3).

Table 5.3 Previous Studies on GMM

Serial No.	Previous Studies	Field
1	Ammann, Oesch, and Schmid (2011)	Firms' Performance
2	Ballot, FakhFakh, and Taymaz (2001)	Firms' Performance
3	Belderbos, Carree, and Lokshin (2004)	Firms' Performance
4	Blundell, Bond, and Windmeijer (2001)	Firms' Performance
5	Caselli, Esquivel, and Lefort (1996)	Economic Growth
6	Christiano and Den Haan (1996)	Business Cycles
7	Duffie and Singleton (1990)	Business Cycles
8	Gordon (1992)	Investment
9	Himmelberg and Petersen (1994)	R&D spending
10	Hubbard, Kashyap, and Whited (1993)	Investment
11	Wintoki et al. (2012)	Firms' Performance

With regards to endogeneity issues, the literature suggests three methods to address the problem: (1) Structural Equation Modelling (SEM); (2) the Two-Stage Least Square (2SLS) regression model; and (3) the GMM regression model. The first two methods require reliable external instruments which are very difficult, if not impossible, to identify (Flannery & Hankins, 2013; Wintoki et al., 2012). In the absence of an appropriate external instrument approach, the GMM estimator approach proposed by Blundell and Bond (1998) is the most appropriate method (Sila et al., 2016). The GMM estimator deals with endogeneity issues that arise from the dynamic nature of the model (Antoniou, Guney, & Paudyal, 2008; Nakano & Nguyen, 2013; Nguyen et al., 2014; Wintoki et al., 2012).

Caselli et al. (1996) conducted an empirical study to investigate the role of economic growth in a cross-country comparison. The study assumed two main sources of inconsistency in empirical growth; (1) endogenous variables; and (2) correlated individual effects. Caselli used GMM estimation technique to remove these two inconsistencies.

GMM estimation has been applied to dynamic panel data because of the following general reasons. (1) Variables in our study are measured by using annual data and it appeared most suitable to consider dynamic measurement; (2) There is a chance of having unobserved effects correlated with regressors, and in this case, GMM is an appropriate technique for

controlling such effects; (3) Due to outliers in our data set, there is doubt about the homogeneity of data; (4) In order to address the issue of autocorrelation, a lagged-dependent variable is considered as it helps to overcome some of the omitted variables varying over the time. According to De Grauwe and Skudelny (2000) and Sila et al. (2016), the lag of the dependent variable helps to capture the effect of omitted variables over time. Similarly, Gujarati (2012) recommends various ways to analyse the nature of the model (static or dynamic).

Additional reasons for using GMM based on our dataset include:

1. The data set of our study exhibits heteroscedasticity (see Chapter 4). This is because the firms in our sample vary in size. Therefore, in light of Arellano and Bond (1991) study, GMM is most appropriate method of estimation as it permits the disturbance term to be non-constant.
2. The dataset is auto correlated since the Wooldridge Test for autocorrelation was significant. Baltagi (2008) argues that the lagged values (through GMM estimation) of the dependent variables with first difference equation will resolve the problem of autocorrelation.
3. Wintoki et al. (2012) argues that GMM is an appropriate estimation technique which explores the dynamic relationship and produces consistent and unbiased results.

Based on Arellano and Bond (1991), Blundell and Bond (1998) suggest a system GMM (S-GMM) for increasing the efficiency of the results, especially in the absence of external instruments. The S-GMM technique applied in our study was proposed by Arellano and Bover (1995) and Blundell and Bond (1998). Roodman (2015) reports that Arellano-Bond has one and two step variants for the estimators. Roodman (2015) recommends the use of two-step estimate, as the standard errors seem to be strictly downward biased. Hence, S-GMM allows using instruments from our dataset.

5.6 System-GMM Results (Dynamic Panel Data Estimation)

Kiviet, Pleus, and Poldermans (2017) and Roodman (2006) argue that two-step S-GMM, in comparison to the one-step version, holds the robust covariance matrix in the context of heteroscedasticity and autocorrelation. Another reason for using two-step S-GMM is that it reports the Sargan test, which one-step S-GMM does not generate. Tables 5.4, 5.5 and 5.6 show the WCM-FP, CG-FP results for two-step S-GMM for all six markets, with ROA, ROE, and TQ. Table 5.4 shows that CCC is negatively significant at 1%, for all six markets. In terms of

ACP, a negatively significant relationship at 1% and 5% levels is observed in all six markets, whereas APP has a positively significant relationship for all six markets at 1%, and 5% levels. Finally, ICP has a negatively significant relationship at 1%, 5% and 10% levels in all of the six markets.

The results for CG component show that NID is negatively significant at 1% and 5% levels for all six markets. ACM has an insignificant relationship in all of the markets. BAA is positively significant at 5% levels for all the six markets. Similarly, EC is also positively significant relationship at 5% for all six markets.

Similarly, Tables 5.7 and 5.8 show the results for the collective impact of WCM and CG on FP, with ROA and ROE as the dependent variables. The results of collective WCM and CG complement the results of the individual relationships between WCM-FP and CG-FP. This indicates that WCM and CG need to be considered together to improve FP in these six developed markets. The S-GMM estimation findings for WCM components are consistent with prior studies; Deloof (2003) for Belgium; Padachi (2006) for Mauritania; Lazaridis and Tryfonidis (2006b) for Greece; Juan García-Teruel and Martinez-Solano (2007) for Spain; Gill et al. (2010) for the US; and Enqvist et al. (2014) for Finland. Similarly, S-GMM results for CG components are also consistent with prior studies (Appel et al., 2016; Cheng, Hong, & Scheinkman, 2015; Conyon, 2014).

Additional analysis was carried out using ROE as a robustness check. Table 5.5, with ROE as a performance measure, reports quite similar results to the ROA results in Table 5.4 for the WCM-FP and CG-FP relationship. Similarly, Table 5.8 reports results with ROE as an alternate measure for determining the FP relationship with the collective effect of WCM and CG as reported in Table 5.7. The results are significant at 1%, 5% and 10% levels. Furthermore, another dimension of FP, TQ's is also used to test the dynamic relationship. Table 5.6 reports the results, which are quite different from ROA and ROE results in Tables 5.4, and 5.5. In the case of WCM, only ACP is significant at a 10% level. In the case of CG, only BAA is significant at a 10% level. Finally, the results for WCM-FP, CG-FP and collective effect of WCM, CG-FP are summarised in Tables 5.9, 5.10 and 5.11.

Table 5.4 Two-Step Robust System GMM Results - ROA

	Lagged DV	CCC	ACP	APP	ICP	Lagged DV	NID	ACM	BAA	EC
US	0.498*	-0.519*	-0.219*	0.215**	-0.239**	0.454*	-0.130*	0.019	0.350**	0.458**
	(0.002)	(0.004)	(0.001)	(0.031)	(0.024)	(0.000)	(0.006)	(0.865)	(0.010)	(0.014)
CA	0.402*	-0.721*	-0.305*	0.299**	-0.119**	0.469*	-0.235*	0.340	0.555**	0.609**
	(0.000)	(0.000)	(0.009)	(0.011)	(0.018)	(0.000)	(0.001)	(0.032)	(0.027)	(0.036)
UK	0.556*	-0.247*	-0.367*	0.824**	-0.241**	0.583*	-0.207*	-0.912	0.353*	0.910**
	(0.000)	(0.009)	(0.000)	(0.048)	(0.010)	(0.000)	(0.001)	(0.401)	(0.002)	(0.016)
FR	0.376**	-0.212*	-0.237*	0.240**	-0.325*	0.491*	-0.271*	-0.244	0.836*	0.237**
	(0.040)	(0.001)	(0.000)	(0.036)	(0.001)	(0.000)	(0.004)	(0.209)	(0.000)	(0.020)
AU	0.331**	-0.650*	-0.518**	0.716**	-0.624*	0.497*	-0.287**	-1.710	0.130**	0.900**
	(0.023)	(0.002)	(0.037)	(0.022)	(0.001)	(0.000)	(0.022)	(0.111)	(0.020)	(0.022)
HK	0.516*	-0.123*	-0.443**	0.476**	-0.556***	0.415*	-0.251*	0.603	0.219**	0.491**
	(0.000)	(0.000)	(0. 016)	(0.037)	(0.068)	(0.000)	(0.000)	(0.553)	(0.043)	(0.043)

Note: P-values in parenthesis show standard coefficients. * ** and ***show significance at 1%, 5% and 10% levels, respectively. Control variables, year dummies and industry dummies are also included and are available upon request.

Source: Author's calculations

Table 5.5 Two-step Robust System GMM Results – ROE

Countries	Lagged DV	CCC	ACP	APP	ICP	Lagged DV	NID	ACM	BAA	EC
US	0.887*	-0.418*	-0.102**	0.313*	-0.356***	0.520*	-0.184**	0.813	0.258**	1.648**
	(0.000)	(0.006)	(0.027)	(0.006)	(0.069)	(0.000)	(0.027)	(0.285)	(0.039)	(0.044)
CA	0.275*	-0.140*	-0.892*	0.106**	-0.425**	0.399*	0.564**	0.460	0.701**	0.745**
	(0.000)	(0.009)	(0.008)	(0.038)	(0.023)	(0.000)	(0.033)	(0.170)	(0.046)	(0.017)
UK	0.598*	-0.243*	-0.131*	0.199**	-0.410*	0.507*	-0.538**	-0.170	0.618*	0.235**
	(0.001)	(0.002)	(0.003)	(0.027)	(0.001)	(0.000)	(0.030)	(0.190)	(0.002)	(0.027)
FR	0.058	-0.209*	-0.164**	0.152*	-0.450**	0.274*	-0.242**	-0.777	0.263*	0.698**
	(0.696)	(0.005)	(0.017)	(0.006)	(0.012)	(0.000)	(0.043)	(0.321)	(0.009)	(0.012)
AU	0.406*	-0.140*	-0.502*	0.470**	-0.239*	0.501**	-0.393**	-0.271	0.945**	0.749**
	(0.002)	(0.009)	(0.003)	(0.032)	(0.004)	(0.021)	(0.032)	(0.213)	(0.036)	(0.017)
HK	0.542*	-0.105*	-0.321*	0.122**	-0.823**	0.446*	-0.270**	-0.280	0.335**	0.775**
	(0.000)	(0.002)	(0.009)	(0.023)	(0.026)	(0.000)	(0.011)	(0.126)	(0.046)	(0.027)

Note: P-values in parenthesis show standard coefficients. * ** and ***show significance at 1%, 5% and 10% levels, respectively. Control variables, year dummies and industry dummies are also included and are available upon request.

Source: Author's calculations

Table 5.6: Two-step Robust System GMM Results - TQ

Countries	Lagged DV	CCC	ACP	APP	ICP	Lagged DV	NID	ACM	BAA	TEC
US	0.834*	-0.001	0.004	0.028	0.245	0.863*	-0.222	-0.954	-0.410***	0.395
	(0.000)	(0.436)	(0.714)	(0.591)	(0.281)	(0.000)	(0.205)	(0.880)	(0.072)	(0.127)
CA	0.702*	-0.633	0.727**	-0.061	0.050	0.641*	-0.003	0.004	-0.165***	-0.032
	(0.000)	(0.435)	(0.040)	(0.493)	(0.578)	(0.000)	(0.720)	(0.553)	(0.054)	(0.227)
UK	0.760*	0.019	0.280*	0.009	-0.161	0.596*	-0.034	0.028	0.018	0.242
	(0.000)	(0.732)	(0.000)	(0.974)	(0.411)	(0.0000)	(0.486)	(0.517)	(0.217)	(0.236)
FR	0.720	-0.342	-0.007	-0.031	-0.004	0.932*	-0.163	0.005	-0.031	0.030
	(0.000)	(0.887)	(0.650)	(0.211)	(0.982)	(0.000)	(0.221)	(0.472)	(0.500)	(0.151)
AU	0.865*	-0.005	-0.009	0.001	-0.636	0.987	-0.033	0.004	-0.161***	0.052
	(0.000)	(0.341)	(0.223)	(0.849)	(0.367)	(0.000)	(0.192)	(0.850)	(0.071)	(0.408)
HK	0.186**	-0.272	0.024	-0.005	0.018	0.620	-0.006	0.015	-0.268***	0.115
	(0.037)	(0.601)	(0.332)	(0.269)	(0.571)	(0.000)	(0.810)	(0.274)	(0.079)	(0.412)

Note: P-values in parenthesis show standard coefficients. *, ** and *** show significance at 1%, 5% and 10% levels, respectively. Control variables, year dummies and industry dummies are also included and are available upon request.

Source: Author's calculations

Table 5.7 Two-step Robust System GMM Results for Collective WCM and CG effect on FP - ROA

Countries	Lagged DV	CCC	ACP	APP	ICP	NID	ACM	BAA	EC
US	0.123*	-0.812*	-0.324**	0.912**	-0.321*	-0.763*	0.021	0.632*	0.131**
	(0.001)	(0.007)	(0.033)	(0.019)	(0.001)	(0.001)	(0.129)	(0.001)	(0.017)
CA	0.432**	-0.309**	-0.654*	0.432**	-0.842**	-0.465**	0.871	0.329**	0.632**
	(0.011)	(0.043)	(0.001)	(0.033)	(0.047)	(0.022)	(0.987)	(0.027)	(0.028)
UK	0.871*	-0.654*	-0.921***	0.149***	-0.653*	-0.761*	0.045	0.769*	0.543**
	(0.000)	(0.000)	(0.076)	(0.065)	(0.000)	(0.001)	(0.432)	(0.001)	(0.031)
FR	0.651**	-0.129**	-0.431**	0.541*	-0.876***	-0.345**	0.111	0.453**	0.652**
	(0.022)	(0.045)	(0.032)	(0.006)	(0.087)	(0.028)	(0.321)	(0.032)	(0.013)
AU	0.514*	-0.387**	-0.761*	0.341**	-0.437*	-0.567*	0.541	0.872*	0.932**
	(0.009)	(0.011)	(0.000)	(0.024)	(0.000)	(0.000)	(0.332)	(0.000)	(0.045)
HK	0.321**	-0.167*	-0.513*	0.765*	-0.398***	-0.873**	0.653	0.322**	0.712**
	(0.044)	(0.005)	(0.008)	(0.001)	(0.087)	(0.039)	(0.149)	(0.041)	(0.019)

Note: P-values in parenthesis show standard coefficients. *, ** and ***show significance at 1%, 5% and 10% levels, respectively. Control variables, year dummies and industry dummies are also included and are available upon request.

Source: Author's calculations

Table 5.8 Two-step Robust System GMM Results for Collective WCM and CG Effect on FP with ROE

Countries	Lagged DV	CCC	ACP	APP	ICP	NID	ACM	BAA	EC
US	0.423*	-0.542*	-0.654**	0.871**	-0.736*	-0.321*	0.811	0.298*	0.431**
	(0.001)	(0.007)	(0.033)	(0.019)	(0.001)	(0.001)	(0.129)	(0.000)	(0.032)
CA	0.512**	-0.569**	-0.314*	0.128**	-0.347**	-0.731**	0.121	0.132**	0.512*
	(0.011)	(0.043)	(0.001)	(0.023)	(0.043)	(0.012)	(0.456)	(0.012)	(0.008)
UK	0.921*	-0.194*	-0.981***	0.342*	-0.378*	-0.991*	0.918	0.761*	0.341**
	(0.000)	(0.000)	(0.076)	(0.001)	(0.001)	(0.000)	(0.318)	(0.003)	(0.045)
FR	0.451**	-0.369**	-0.671**	0.621*	-0.419**	-0.342**	0.039	0.981**	0.812*
	(0.022)	(0.045)	(0.032)	(0.001)	(0.017)	(0.040)	(0.112)	(0.021)	(0.001)
AU	0.184*	-0.497**	-0.411*	0.439***	-0.753*	-0.321**	0.001	0.712*	0.352***
	(0.009)	(0.011)	(0.000)	(0.064)	(0.000)	(0.022)	(0.675)	(0.001)	(0.082)
HK	0.101**	-0.297*	-0.883*	0.456**	-0.871***	-0.134**	0.542	0.126**	0.612*
	(0.044)	(0.005)	(0.008)	(0.011)	(0.074)	(0.033)	(0.343)	(0.018)	(0.002)

Note: P-values in parenthesis show standard coefficients. *, ** and ***show significance at 1%, 5% and 10% levels, respectively. Control variables, year dummies and industry dummies are also included and are available upon request.

Source: Author's calculations

Table 5.9 Summarised Form of WCM-FP Results Using SGMM Estimation

Variables	US	CA	UK	FR	AU	HK
CCC	-	-	-	-	-	-
ACP	-	-	-	-	-	-
APP	+	+	+	+	+	+
ICP	-	-	-	-	-	-

Table 5.10 Summarised Form of CG-FP Results Using SGMM Estimation

Variables	US	CA	UK	FR	AU	HK
NID	-	-	-	-	-	-
ACM	+/-	+/-	+/-	+/-	+/-	+/-
BAA	+	+	+	+	+	+
EC	+	+	+	+	+	+

Table 5.11 Summarised Form for Collective Effect of WCM and CG on FP Using SGMM Estimation

Variables	US	CA	UK	FR	AU	HK
CCC	-	-	-	-	-	-
ACP	-	-	-	-	-	-
APP	+	+	+	+	+	+
ICP	-	-	-	-	-	-
NID	-	-	-	-	-	-
ACM	+/-	+/-	+/-	+/-	+/-	+/-
BAA	+	+	+	+	+	+
EC	+	+	+	+	+	+

It is interesting to note that the results obtained by S-GMM are almost similar to those obtained using OLS and fixed-effect estimations (see Chapter 4). The exception is observed in the case of ACM's which are insignificant. Before generalising the results, Baltagi (2008) and Roodman (2006) argue that the reliability of S-GMM results should be checked using diagnostic tests, discussed in detail in the next section.

5.7 Diagnostics Tests for S-GMM

Our data set has some econometric problems, from heteroscedasticity to endogeneity. To resolve these problems, S-GMM was used as an appropriate estimation technique. To check the reliability of S-GMM estimation there are several diagnostic tests which can be performed (Amira, Mouldi, & Feridun, 2013; Baum, Schaffer, & Stillman, 2007; Kiviet et al., 2017; Roodman, 2006), including AR 1 and AR 2 diagnostic tests; the Hansen J. Test; Difference in Hansen Test; assumption of steady state; and counting the number of instruments.

5.7.1 Autocorrelations Tests (AR 1 and AR2)

According to Arellano and Bond (1991) and Tran and Tsionas (2013), to estimate the S-GMM technique, the first order correlation is required, whereas second order is not required in the error term. For this purpose, they suggest checking the AR (1) and AR (2) diagnostic tests. The null hypothesis for these tests is that no autocorrelation exists. The second and third columns in Tables 5.12 and 5.13 and Appendix B present the results. In the case of AR (2), the p-values are significant at conventional levels. In the case of AR (1), the p-values are significant at a 5% level. This implies that there is a first order correlation which is necessary to estimate the S-GMM model.

5.7.2 Over-Identification of Instruments (The Hansen J. Test)

Another important assumption which needs to be considered while estimating S-GMM is the validity of instruments. The Hansen J. Test is considered the most appropriate method for this (Amira et al., 2013; Baum et al., 2007). The fourth column in Tables 5.12, and 5.13 and Appendix B show the results. The null hypothesis for this test is that J = 0 which means that restrictions of over-identification are true and there is exogeneity between the instruments. The p-values are well above the significance level, thus the null hypothesis cannot be rejected. In light of Roodman (2006) work, this means valid or correctly identified instruments are used.

5.7.3 Test of Exogeneity (Difference in Hansen Test)

As discussed earlier (see section 5.2.1), S-GMM holds the assumption of lagged differences as instruments. For this, Baum et al. (2007) and Roodman (2006) recommend using the

Difference in Hansen test. The null hypothesis is that lagged differences are exogenous. The fifth column in Tables 5.12 and 5.13 and Appendix B reports the results. The p- values are above the significance level, which implies that the null hypothesis cannot be rejected. This shows that all of the instruments used in our study are strictly exogenous.

5.7.4 Steady State

According to Roodman (2006), the validity of instruments to be used in S-GMM can also be checked based on the assumption of steady state. In this assumption, the systematic relationship between the FE and long-term values is tested. This implies that the coefficient of the dependent variables (lagged) should be less than one. The results reported in Tables 5.12 and 5.13 and Appendix B show that our lagged dependent variables (ROA, ROE, and TQ) all have coefficient values less than one. Thus Roodman's assumption is fulfilled.

5.7.5 Counting of Instruments

Another assumption that can be used to check the validity of S-GMM results is to count the number of instruments (Roodman, 2015). In principle, the number of instruments should be less than the number of observations. Tables 5.12, and 5.13 and Appendix B show that this assumption also holds true in our case, as the number of instruments is less than the number of observations for all of the markets.

The validity and relaibllity of S-GMM estimation have been confirmed, based on these diagnositic tests. Therefore, the S-GMM results are consistent, efficient and not baised.

Table 5.12 Diagnositics Test - SGMM – ROA

	Model 1						Model 2					
Markets	**AR (1)**	**AR (2)**	**Hansen. J.O. ld**	**Hansen. J. Diff**	**No. INST**	**Obs.**	**AR (1)**	**AR (2)**	**Hansen. J.O. ld**	**Hansen. J. Diff**	**No. INST**	**Obs.**
US	0.040	0.992	0.184	0.435	127	1031	0.001	0.543	0.168	0.324	127	2376
CA	0.041	0.147	0.676	0.599	119	451	0.013	0.341	0.221	0.482	105	316
UK	0.004	0.785	0.200	0.533	127	1142	0.037	0.336	0.503	0.513	127	679
FR	0.039	0.454	0.215	0.313	127	370	0.024	0.570	0.245	0.565	127	305
AU	0.047	0.259	0.747	0.482	115	497	0.019	0.787	0.177	0.482	66	170
HK	0.038	0.178	0.144	0.430	121	708	0.021	0.175	0.884	0.568	119	664

Note: AR (1) shows values for first order test for autocorrelation, AR (2) is the test for second-order autocorrelation, Hansen. J.O. ld is Hansen Test for over identification and Hansen. J. Diff is difference test for exogeneity. However, No. INST and Obs. refer to the number instruments And groups, respectively. Control variables, year dummies and industry dummies are also included and are available upon request.

Source: Author's calculations

Table 5.13 Diagnositics Test - SGMM – ROE

	Model 1						Model 2					
Markets	**AR (1)**	**AR (2)**	**Hansen. J.O. ld**	**Hansen. J. Diff**	**No. INST**	**Obs.**	**AR (1)**	**AR (2)**	**Hansen. J.O. ld**	**Hansen. J. Diff**	**No. INST**	**Obs.**
US	0.194	0.954	0.340	0.416	127	1031	0.020	0.780	0.637	0.225	127	2376
CA	0.009	0.479	0.453	0.589	119	451	0.037	0.792	0.259	0.495	105	316
UK	0.003	0.525	0.279	0.537	127	1142	0.056	0.328	0.480	0.693	127	679
FR	0.176	0.607	0.121	0.321	127	370	0.015	0.244	0.502	0.365	127	305
AU	0.016	0.325	0.963	0.779	115	497	0.023	0.636	0.813	0.792	66	170
HK	0.012	0.175	0.675	0.770	121	708	0.021	0.096	0.523	0.325	119	664

Note: AR (1) shows values for first order test for autocorrelation, AR (2) is the test for second-order autocorrelation, Hansen. J.O. ld is Hansen test for over identification and Hansen. J. Diff is difference test for exogeneity. Whereas, No. INST and Obs. refer to the number of instruments and groups, respectively. Control variables, year dummies and industry dummies are also included and are available upon request.

Source: Author's calculations

5.8 WCM and CG during 2008 GFC

The recent 2008 GFC is often considered to be the most serious financial crisis since the Great Depression of the 1930s (Blundell-Wignall et al., 2008; Cheffins, 2009; Jagtiani & Lang, 2010; Kirkpatrick, 2009). Sumedrea (2013)notes that the 2008 GFC has forced many firms to analyse the relationship between available resources and their performance.

Prior studies have given little attention to the impact of WCM and CG on FP during the 2008 GFC. It is difficult to expand the results of these studies, as most are conducted for only a specific country and are mostly qualitative in nature (see for example, Baveld 2012 – Netherlands; Gunay and Kesimili 2011 – Turkey; Scholleova 2012 – Czech Republic; and VU and Phan 2016 – Vietnam). In order to explore the impact of WCM and CG during the 2008 GFC, our study includes the term financial crisis (FC*) with components of WCM and CG. The following regression models are estimated as follows;

For WCM

$$FP_{it} = \alpha + \beta_1 LFP_{it-1} + \beta_2 WCM_{it} + \beta_3 FC^* WCM_{it} + \beta_4 Control_{it} + \eta_i + e_{it} \quad (5.7)$$

For CG

$$FP_{it} = \alpha + \beta_1 LFP_{it-1} + \beta_2 CG_{it} + \beta_3 FC^* CG_{it} + \beta_4 Control_{it} + \eta_i + e_{it} \quad (5.8)$$

Where FC* - WCM and FC* - CG investigate the relationship between the 2008 GFC with WCM and CG, respectively. FC* - WCM includes the financial crisis term with components of WCM (CCC, ACP, APP and ICP). FC* - CG includes the 2008 GFC with CG determinants (NID, ACM, BAA, and EC). To measure the financial crisis relationship, a dummy variable is used with a value of 1 in 2008 and 0 otherwise. Table 5.14 presents the results of equations 5.7 and 5.8.For robustness, we included year dummy and the un-tabulated results confirm results presented in Table 5.14.

In terms of WCM components, the inclusion of FC* with CCC, APP, and ICP show insignificant results in all six of the markets. However, ACP (in terms of WCM components), has a negative and significant relationship with FP at 1% and 5% levels during the 2008 GFC period in all six

markets. The findings suggest that the earliest collection of accounts receivable, during any kind of financial crisis, improves FP in these markets. The findings are similar those reported by Enqvist et al. (2014) and VU and Phan (2016) for the Finnish and Vietnamese markets, respectively.

In terms of CG, the inclusion of FC* with NID, and ACM also show insignificant results in all six of the markets, whereas BAA is negatively significant at a 1% level and EC is positively significant at a 1% level for all six markets during the 2008 GFC. For robustness purposes, a year as a dummy variable is used and similar results are found (these are not reported here but are available upon request).

Table 5.14 Two-step Robust System GMM Results with ROA (2008 GFC)

Markets	FC* CCC	FC* ACP	FC* APP	FC* ICP	FC* NID	FC* ACM	FC* BAA	FC* EC
US	-0.022	-0.119**	0.458	0.001	-0.131	-0.251	-0.549**	0.0744*
	(0.136)	(0.043)	(0.148)	(0.985)	(0.397)	(0.876)	(0.018)	(0.001)
CA	-0.050	-0.130**	0.002	0.021	-0.005	-0.061	-0.129**	0.354**
	(0.671)	(0.047)	(0.212)	(0.118)	(0.273)	(0.352)	(0.031)	(0.031)
UK	-0.002	-0.364*	-0.182	0.003	-1.511	0.798	-0.210*	0.459*
	(0.519)	(0.003)	(0.341)	(0.545)	(0.495)	(0.800)	(0.005)	(0.007)
FR	-0.001	-0.251*	-0.212	0.060	-0.266	0.673	-0.335*	0.127**
	(0.935)	(0.007)	(0.580)	(0.628)	(0.767)	(0.253)	(0.007)	(0.024)
AU	0.005	-0.651*	0.010	0.074	0.014	0.020	-0.094*	0.972*
	(0.212)	(0.004)	(0.320)	(0.432)	(0.221)	(0.111)	(0.000)	(0.000)
HK	0.016	-0.566*	0.766	0.563	-0.872	0.213	-1.071*	1.840*
	(0.212)	(0.001)	(0.847)	(0.858)	(0.210)	(0.141)	(0.001)	(0.001)

Note: P-values in parenthesis show standard coefficients. *, ** show significance at 1% and 5% levels, respectively. Control variables and year dummies are also included.

Source: Author's calculations

Table 5.15 Summarised Form of WCM-FP Results during the 2008 GFC

Variables	US	CA	UK	FR	AU	HK
CCC	+/-	+/-	+/-	+/-	+/-	+/-
ACP	-	-	-	-	-	-
APP	+/-	+/-	+/-	+/-	+/-	+/-
ICP	+/-	+/-	+/-	+/-	+/-	+/-

Table 5.16 Summarised Form of CG-FP Results during the 2008 GFC

Variables	US	CA	UK	FR	AU	HK
NID	+/-	+/-	+/-	+/-	+/-	+/-
ACM	+/-	+/-	+/-	+/-	+/-	+/-
BAA	-	-	-	-	-	-
EC	+	+	+	+	+	+

5.9 Chapter Summary

The relationship between WCM, CG and FP is dynamic in nature, based on theoretical and empirical evidence. The adjusted R^2 showed significant increases when dynamic OLS is applied, in comparison to traditional (static) OLS, indicating the presence of a dynamic relationship. The lagged dependent variables in all markets are significant at 5% or less, hence the dependent variable acts as a regressor. To identify the exogenous regressors, the Wooldridge Test for strict exogeneity, suggested by Wintoki et al. (2012), was applied. The results of the Wooldridge Test shows that current FP is significantly related (at 10% or less) to future WCM and CG components' efficiency. The presence of the dynamic nature and significant results for the Wooldridge test supports the argument that there is an endogeneity problem in the WCM, CG, and FP relationship and it needs to be addressed using dynamic models (Baltagi, 2008).

To estimate the dynamic relationship between WCM, CG and FP, two-step S-GMM estimation was applied. The results for WCM components with ROA, shows that CCC is negatively significant at a 1% level for all markets. The ACP is negatively significant at 1% and 5% levels for all of the six markets. Similarly, APP is positive and has a significant relationship

at 1% and 5% levels for all of the six markets. ICP is negatively significant at the 10% level for all of the six markets.

Similarly, the CG components (NID, BAA, ACM and EC), are significant at 1% and 5% levels, except for ACM. The results for ACM's are quite different from OLS and FE results, as reported in Chapter 4. ACM's has a significant relationship in OLS and FE, but insignificant in S-GMM. We also reviewed the relationship between WCM, CG, and FP using ROE and TQ. The results with ROE are quite similar to ROA and in the case of TQ, ACP and BAA are significant at the 10% level. Similarly, the collective effect of WCM and CG with ROA also complements the relationship, obtained while investigating the individual relationship between WCM-FP and CG-FP. For robustness purposes, an alternative measure of FP (ROE and TQ) has been used and produced similar results to ROA.

To identify the appropriateness of S-GMM estimation, various diagnostic tests (see section 5.7) that included AR (1), AR (2) tests for autocorrelation, Hansen J. Tests (over-identification and difference in), the assumption of steady state and counting instruments method were applied. All of these tests support the use of the S-GMM estimation technique to investigate the relationship between WCM, CG and FP. Finally, we analysed the relationship between WCM, CG and FP during the 2008 GFC with the financial crisis term (FC*).

The result for the 2008 GFC period shows that the relationship is statically insignificant for all WCM components, except for accounts receivable, which shows a negative relationship for all of the six markets. This means that by managing accounts receivable, firms can manage their performance efficiently during periods of financial crises. In the case of CG components, BAA is negatively significant and EC exhibits a positive significant relationship during the financial crisis in all six markets. This implies that those firms which have younger board members performed more efficiently during the financial crisis. In terms of EC, firms which offer more incentives are more likely to retain their executives and perform well during a crisis instead of leaving the firms during turmoil. The results of the financial crisis were checked using a robustness test by including year dummy of 2008.

This chapter contends that the relationship between WCM, CG, and FP is dynamic in nature and requires dynamic estimation techniques(S-GMM), in order to produce unbiased and consistent results. The next chapter provides an overall summary of this research, along with conclusion, policy implications, and future directions.

Chapter 6
Summary and Conclusion

6.1 Introduction

Prior literature discussed in Chapter 2 indicates that in order to maintain the liquidity position and to foster FP, the optimum level of WC needs to be maintained. The last two decades have shown increased academic attention on the role of WCM on FP. WCM is not only crucial to insulate firms during periods of financial crises, but if managed strategically can improve FP and firm competitiveness.

Further, corporate scandals and financial crises around the globe have highlighted the importance of efficient management of WC and also the need of good CG practices. Capital market investors in developed markets, especially in the US and Europe, are now interested in FP in terms of WCM and CG practices. As discussed in sections 2.2.3 and 2.4.2, inefficient WCM and weak CG had a negative impact on FP during the 2008 GFC and is one of the main reasons behind the closure of many businesses.

Keeping in view the importance of WCM and CG in attaining FP, this research enhances our understanding of the empirical relationship between WCM-FP and CG-FP on an individual basis and also expanded our knowledge further with the collective effect (in a dynamic framework), which has been ignored in previous studies. For this purpose, six developed markets (see Table 3.4) were selected; two markets from each sub-region (America, Europe & Middle East, and Pacific) were chosen. These were developed markets as classified by MSCI. As discussed in section 3.5.1, the following criteria were applied to select our sample markets namely; (1) knowledge economy index (KEI), (2) market capitalisation (MC), and (3) GDP growth rate.

To have a better understanding of the WCM, CG and FP phenomenon, the following objectives were investigated:

1. To investigate whether the relationship between WCM-FP and CG-FP is dynamic in nature, in developed markets.
2. To measure and compare the individual impact of WCM-FP and CG-FP, in developed markets.
3. To measure the collective effect of WCM and CG on FP in developed markets.

4. To determine the impact of WCM-FP and CG-FP during the 2008 GFC, on developed markets.

This chapter presents an overall summary and conclusion of this research. This chapter also discusses research contributions, provides some policy implications, limitations and recommendations for future research. The remainder of the chapter is organised as follows. Section 6.2 reiterates the data sample and research methodology used in this study. While section 6.3 provides a summary of major findings, section 6.4 outlines the study's research contribution. Section 6.5 provides policy implications. The last section, presents limitations and recommendations for future research.

6.2 Data Sample and Research Methodology

Data for publicly listed firms on the respective stock exchanges of six developed markets were obtained from the *Bloomberg* database for the period of 2007-2016. The 10-year study period was chosen based on Wintoki's (2012) argument that any study with panel data of fewer than 10 years will produce biased results. The proposed study time period was also selected based on research objective 4, which was to determine the impact of WCM and CG during the 2008 GFC on FP.

In addition, various filters were used in order to improve the precision of the data (see section 3.5). The data filters transformed the data into an unbalanced panel data set. Thus, panel data methodology was used because of its various benefits, such as the assumption that firms are heterogeneous, have less collinearity, and have more informative data (Baltagi, 2008; Baltagi & Kao, 2001).

Prior studies have mostly estimated the empirical relationship between WCM, CG and FP by using OLS and fixed-effects (see Tables 3.3 and 3.4) and report divergent results. The presence of dynamic relationship in this research (see sections 5.1 and 5.2) indicates that the results of prior study, obtained using OLS and FE, have produced biased and inconsistent results. This fact is supported by Baltagi's (2008) argument. Therefore, in addition to OLS and FE methods, this study also used dynamic panel data (DPD) estimation techniques to measure the dynamic relationship (see research objective 1).

6.3 Summary of Major Findings

6.3.1 Descriptive Findings

The descriptive statistics of WCM components show the mean value for cash conversion cycle (CCC) varies from 43.00 days to 303.50 days. The data shows Canada is the most efficient market (43 CCC days) compared to Hong Kong which is the least efficient market (303.50 CCC days). The average mean value for collection period (ACP) varies from 45.00 to 154.79 days. The US is the most efficient market (45 days) compared to Australia, the least efficient market (154.79 days). The average payment period (APP) mean value varies from 62.01 to 95.19 days. The UK is the most efficient market (95.19 days), compared to the US, which is the least efficient market (62.01 days). The inventory conversion period (ICP) mean value varies from 59.08 to 101.98 days. UK firms hold inventory for a longer period of time, compared to the other five developed markets.

The descriptive statistics of CG components show the mean value for the number of the independent directors (NID) in the US market varies from 3.57 to 8.41. The US has the highest NID (8.41), while Hong Kong exhibits the lowest number (3.57). The mean value for audit committee meetings (ACM) varies from 3 to 8 meetings per year. The US market exhibits the highest number of ACM (8) in a year, while the Hong Kong market exhibits the lowest number of ACM (3) in a year. In terms of the board members' average age (BAA), those in the US market are the oldest on average (62.02 years), while the Hong Kong market has the youngest members on average (55.08 years). Similarly, the executive compensation (EC) mean value varies from $14.75 to $17.02. The US firms exhibit the highest EC ($17.02) whereas; France firms exhibit the lowest ($14.75) among the six developed markets.

6.3.2 Empirical Findings

Prior studies used regression (OLS and fixed-effect) analysis to measure the relationship between WCM-CG and FP (see Tables 3.3 and 3.4). This study used OLS, followed by the fixed-effect estimation method. Before applying the OLS estimation, it is important to perform basic diagnostics tests on the dataset to detect spurious regression problems, such as stationarity in data and multicollinearity. These tests resemble the basic assumptions of Classic Linear Regression Model (CLRM). The result of these tests show that the data set has no issue of unit root and multicollinearity (Gujarati, 2012; Kalnins, 2018).

6.3.2.1 WCM-CG and FP – OLS and Fixed-Effects Estimation

We applied the OLS and fixed-effect methods to investigate the relationship between WCM, CG and FP. The results for WCM and CG components are summarised in Tables 6.1 and 6.2, respectively. Table 6.1 shows that CCC has a negative significant relationship at 1% with ROA, for the US, Canada, UK and Hong Kong markets. However, the Australian and French markets exhibit negative but insignificant relationships. The results are consistent with previous studies that use OLS and FE estimation techniques (Deloof, 2003; Enqvist et al., 2014; Juan García-Teruel & Martinez-Solano, 2007; Lazaridis & Tryfonidis, 2006b; Tingbani, 2015)and contrary to Chowdhury and Amin (2007) and Gakure et al. (2012). However, no insignificant relationship was documented in Bratland and Hornbrinck (2013) and Jahfer (2015) studies. This implies that FP can be improved by reducing the CCC. This result also supports Enqvist et al. (2014) claim that business cycles affect the relationship between WCM and FP. Thus, as a policy implication, firms can improve FP by reducing CCC. It also provides a way forward for other markets (to efficiently forecast future economic conditions), in order to avoid negative effects during any economic or financial crisis.

Next, we investigated the relationship between ACP and FP indicators. The results in Table 6.1 show a positive and significant relationship at the 1% level for both the US and the UK and are consistent with Sharma and Kumar (2011b) work on India. However, in the case of the Canadian and Hong Kong markets, the ACP coefficient is negatively significant at a 1% level. The results are consistent with Bratland and Hornbrinck (2013) work on Holland, Deloof (2003) for Belgium, Enqvist et al. (2014) for Finland, Juan García-Teruel and Martinez-Solano (2007) for Spain, Gill et al. (2010) for the US, and Tingbani (2015) for the UK markets. This implies that firms can increase their performance by reducing the period of accounts receivable. In short, the earliest possible collection of receivables would help boost FP. However, in the case of France and Australia, ACP has no significant relationship with FP.

Table 6.1 also shows that the APP coefficient is positive and significantly related to ROA at the 1% level for Canadian and Australian markets. This study's positive results are consistent with those reported by Nobanee and Alhajjar (2009) for Japanese, and Mathuva (2009) for Kenyan markets. The positive relationship indicates that firms with higher profitability wait longer to pay back their payables (see Lazaridis and Tryfonidis (2006b)) and use that money as a source of financing for other investments. However, in the case of the US and French markets, the

findings are negatively significant with ROA at 1%.These findings are consistent with Deloof (2003) for Belgium, Padachi (2006) for Mauritania, Lazaridis and Tryfonidis (2006b) for Greece, and Enqvist et al. (2014) for Finland. The negative relationship indicates that firms in the US and France believe in shorter duration of accounts payable cycle, which means that they use cash discounts on accounts payable, instead of trade credit as a source of financing. The UK and Hong Kong markets show no significant relationship and are consistent with results reported by Juan García-Teruel and Martinez-Solano (2007) for Spain, and Gill et al. (2010) for the US markets. The insignificant results indicate that accounts payable does not have any role to play in FP.

Finally, the ICP coefficient is negatively associated with ROA, for all of the six developed markets. However, it is negatively significant at the 1% level for the Canadian market and 5% for the US, the UK, and Hong Kong. These findings are consistent with Enqvist et al. (2014) for Finland, Juan García-Teruel and Martinez-Solano (2007) for Spain, and Nobanee and Alhajjar (2009) for Japan. The negative relationship between ICP and FP indicates that a reduction in the inventory period helps to increase FP. However, the French and Australian markets show no significant relationship. Gill et al. (2010), and Padachi (2006) had similar results for the US and Mauritia, respectively.

Table 6.2 reports the results for CG components with FP indicator (ROA). The NID coefficient is negatively significant (at a 1% level) for the US, UK, Australia and Hong Kong and is negatively significant (at a 5% level) for the Canadian market. However, France shows a negative, but insignificant, relationship. The NID findings are consistent with Erickson, Park, Reising, and Shin (2005) and Dahya, Dimitrov, and McConnell (2008) results. The negative relationship between NID and FP indicates that lesser NID's help to increase FP in developed markets.

The next variable, ACM is negatively significant (at a 1% level) for France and Australia and is negatively significant (at a 5% level) for the UK market. However, the US, Canada and Hong Kong show no significant relationship. The ACM findings are consistent with previous studies (Anderson et al. (2004); Weir, Laing, and McKnight (2003) .

In terms of BAA, the US and the UK have a positive and significant relationship (at a 1% level) whereas; Canada and Hong Kong have a negative significant relationship (at a 1% level). However, France and Australia show no significant relationship. The positive relationship

between BAA and FP indicates that older board members help increase FP. The findings are consistent with Carter et al. (2010) and Bonn, Yoshikawa, and Phan (2004) findings.

Finally, the EC coefficient is positive and significant (at a 1% level) for five developed markets, except for Canada. The findings are consistent with other works such as Conyon (2014). In the case of the Canadian market, EC exhibits a negative and significant relationship at the 1% level. The positive relationship indicates that more compensation will lead towards better FP in these markets.

Table 6.1 Summary Results of WCM Components – OLS and Fixed-Effect Estimations

Markets	WCM Components	OLS	Fixed-Effect
The United States	CCC	-	-
	ACP	-	-
	APP	-	+/-
	ICP	-	+
Canada	CCC	-	-
	ACP	-	+/-
	APP	+	-
	ICP	-	-
The United Kingdom	CCC	-	-
	ACP	-	-
	APP	+/-	+/-
	ICP	-	-
France	CCC	+/-	-
	ACP	+/-	+/-
	APP	-	-
	ICP	+/-	+/-
Australia	CCC	+/-	+/-
	ACP	+/-	+/-
	APP	+	+
	ICP	+/-	+/-
Hong Kong	CCC	-	-
	ACP	+/-	+/-
	APP	+/-	+/-
	ICP	-	-

Note: (+) and (-) signs show a positive and negative relationship between WCM and firm performance (ROA). +/- shows no significant relationship.

Source: Author's calculations

Table 6.2 Summary Results of CG Components – OLS and Fixed-Effect Estimations

Markets	CG Components	OLS	Fixed-Effect
The United States	NIDs	-	-
	ACM	+/-	+/-
	BAA	+	+
	EC	+	+
Canada	NIDs	+	+
	ACM	+/-	+/-
	BAA	-	-
	EC	-	-
The United Kingdom	NIDs	-	-
	ACM	-	-
	BAA	+	+
	EC	+	+
France	NIDs	+/-	-
	ACM	-	-
	BAA	+/-	+/-
	EC	+	+
Australia	NIDs	-	-
	ACM	-	-
	BAA	+/-	+/-
	EC	+	+
Hong Kong	NIDs	-	-
	ACM	+/-	+/-
	BAA	-	-
	EC	+	+

Note: (+) and (-) signs show a positive and negative relationship between CG and FP (ROA). +/- shows no significant relationship.

Source: Author's calculations

Several diagnostic tests were used to check for heteroscedasticity and serial correlation in the data. These include the Breusch-Pagan/Cook-Weisberg test for heteroscedasticity (see section 4.4.1) and the Wooldridge Test for Autocorrelation (see section 4.4.2). These tests report the presence of heteroscedasticity and autocorrelation in the data set and do not provide BLUE results. According to Wintoki et al. (2012) endogeneity exists when OLS and FE methods do not provide BLUE results. Gujarati (2012) suggests using DPD estimation to rectify such problem. The next section summarises the dynamic relationship between WCM, CG and FP.

6.3.2.2 WCM -CG and FP – Dynamic Panel Data Estimation

Research objective 1 was designed to investigate whether the relationship between WCM, CG and FP was dynamic in nature. In this context, the theoretical background discussed in section 5.2.1 describes the potential existence of simultaneity.

The dynamic OLS was applied to test the significance of the lagged dependent variable (Wintoki et al., 2012). Wintoki et al. (2012) explains that increase in the Adj. R^2 in dynamic OLS compared to traditional (static) OLS clearly indicates the dynamic relationship. Table 5.1 shows a significant increase in Adj. R^2 of the dynamic OLS, compared to the static OLS. Besides an increase in Adj. R^2, the lagged dependent variables coefficients are significant at a 0.01 level for all of the six developed markets. This supports the existence of a dynamic relationship in this study (see section 5.2.2.1and Table 6.3).

Table 6.3 Indication of Dynamicity between WCM-FP and CG-FP

	Developed Markets					
	US	CA	UK	FR	AU	HK
Is WCM-FP dynamic?	Yes	Yes	Yes	Yes	Yes	Yes
Is CG-FP dynamic?	Yes	Yes	Yes	Yes	Yes	Yes

The results in Table 5.2 showed the future values of WCM and CG components are significant at 1% and 5%, respectively. This implies that current FP is significantly correlated with future values of one or more of the explanatory variables in this study. Therefore, the null hypothesis is rejected. It also violates the strict exogeneity assumption. According to Wooldridge (2002), the use of dynamic model estimation techniques, such as the OLS and fixed-effect estimation technique, will produce inconsistent results.

According to Wintoki et al. (2012), using a sufficient number of lags is important because too few lags may not capture the complete impact of the past on the present. In order to determine the suitable number of lags, the current FP was regressed on past performance by using ROA, after controlling the components of WCM, CG and control variables such as CR, SG and FS (for more detail on control variables see section 3.4). Initially, two lags were

considered and were significant at a 1% level. In order to find the optimal instruments, longer lags (third and fourth) were investigated and were significant.

More lags can reduce the observations from data set and caution is required. Hence, the required information can be traced by using the most recent lag (first lag), as the effects of other lags are subsumed by the first lag. Therefore, a first lag was considered as the regressor and subsequent lags were used for IV instruments and GMM in this study.

Next, we conducted a two-step S-GMM for investigating the dynamic relationship between WCM, CG and FP. Kiviet et al. (2017) and Roodman (2006) argue that in comparison to the one step GMM, the two-step S-GMM holds robust covariance matrix in the context of heteroscedasticity, autocorrelation and endogeneity problems. The results in Table 6.4 show that CCC is negatively significant at 1% for all six markets. In terms of ACP, all six markets exhibit a negatively significant relationship at a 1% level. However, APP is positively significant in all six markets and ICP is negatively significant at the 10% level for all of the six developed markets. The findings of S-GMM estimation for WCM components are consistent with prior studies; Deloof (2003) for Belgium, Padachi (2006) for Mauritania, Lazaridis and Tryfonidis (2006b) for Greece, Juan García-Teruel and Martinez-Solano (2007) for Spain, Gill et al. (2010) for the US and Enqvist et al. (2014) for Finland. This implies that efficient management of WC components helps to improve FP in these six developed markets. Specifically, CCC, ACP, and ICP exhibit a negative relationship with FP. This implies that reducing these components will improve FP. However, APP has a positive relationship which shows that delaying the payment period helps to increase FP in the six developed markets.

The results for CG components in Table 6.5 show that NID is negatively significant at a 1% level, for all of the six developed markets. The variable ACM shows an insignificant relationship in the six markets under study. The results show BAA is positively significant at a 1% level for all of the six developed markets. EC is positively significant for all of the six developed markets at the 5% level. Similarly, the S-GMM results for CG components are also consistent with prior studies (Cheng et al., 2015; Conyon, 2014; Core et al., 1999; Leonard, 1990), which indicate that CG does effect FP. Table 6.6 shows that the collective effect of WCM and CG on FP complements the results produced by the individual relationship between WCM-FP and CG-FP. This implies that in order to improve their performance, firms need to consider WCM and CG together. Finally, to test the reliability of SGMM, several diagnostics

tests (see section 5.7) were conducted. The results verified that S-GMM was the most appropriate estimation technique for testing the dynamic relationship. This indicates that WCM-FP and CG-FP relationship is dynamic in nature and that GMM is most appropriate estimator to investigate the dynamic relationship between WCM-FP and CG-FP.

Furthermore, to examine the impact of WCM and CG on FP during the 2008 GFC, the financial crisis term was included in the model as a dummy variable. In terms of WCM components, the inclusion of the financial crisis variable shows insignificant results for CCC, APP and ICP in all of the six developed markets (summarised in Table 6.7). However, ACP is negatively and significant at 1% level during the 2008 GFC in all of the six markets. In terms of CG, the inclusion of the financial crisis variable shows that NID and ACM are insignificant for all markets during the financial crisis, BAA is negatively significant at the 1% level and EC is positively significant at the 1% level for all six markets during 2008 GFC (summarised in Table 6.8). These findings suggest that future financial crises can be handled with appropriate strategies or through firms paying attention to ACP, BAA and EC in developed markets.

Table 6.4 Summarised Results of WCM Components – SGMM Estimations

Markets	WCM Components	SGMM
The United States	CCC	-
	ACP	-
	APP	+
	ICP	-
Canada	CCC	-
	ACP	-
	APP	+
	ICP	-
The United Kingdom	CCC	-
	ACP	-
	APP	+
	ICP	-
France	CCC	-
	ACP	-
	APP	+
	ICP	-
Australia	CCC	-
	ACP	-
	APP	+
	ICP	-
Hong Kong	CCC	-
	ACP	-
	APP	+
	ICP	-

Note: (-) and (+) signs show a negative and positive relationship between WCM and FP (ROA).

Source: Author's calculations

Table 6.5 Summarised Results of CG Components – SGMM Estimations

Markets	CG Components	SGMM
The United States	NIDs	-
	ACM	+/-
	BAA	+
	EC	+
Canada	NIDs	-
	ACM	+/-
	BAA	+
	EC	+
The United Kingdom	NIDs	-
	ACM	+/-
	BAA	+
	EC	+
France	NIDs	-
	ACM	+/-
	BAA	+
	EC	+
Australia	NIDs	-
	ACM	+/-
	BAA	+
	EC	+
Hong Kong	NIDs	-
	ACM	+/-
	BAA	+
	EC	+

Note: (+) and (-) signs show a positive and negative relationship between CG and FP (ROA). +/- shows no significant relationship.

Source: Author's calculations

Table 6.6 Summary Results of Collective Effect of WCM and CG on FP – SGMM Estimations

Markets	WCM+ CG Components	SGMM
The United States	CCC	-
	ACP	-
	APP	+
	ICP	-
	NIDs	-
	ACM	+/-
	BAA	+
	EC	+
Canada	CCC	-
	ACP	-
	APP	+
	ICP	-
	NIDs	-
	ACM	+/-
	BAA	+
	EC	+
The United Kingdom	CCC	-
	ACP	-
	APP	+
	ICP	-
	NIDs	-
	ACM	+/-
	BAA	+
	EC	+
France	CCC	-
	ACP	-
	APP	+
	ICP	-
	NIDs	-
	ACM	+/-
	BAA	+
	EC	+
Australia	CCC	-
	ACP	-
	APP	+
	ICP	-
	NIDs	-
	ACM	+/-
	BAA	+
	EC	+
Hong Kong	CCC	-
	ACP	-
	APP	+
	ICP	-
	NIDs	-
	ACM	+/-
	BAA	+
	EC	+

Note: (+) and (-) signs show a positive and negative relationship between CG and FP (ROA). +/- shows no significant relationship.

Source: Author's calculations

Table 6.7 Summarised Results of WCM Components - SGMM Estimation (2008 GFC)

Markets	WCM Components	SGMM
The United States	CCC	+/-
	ACP	-
	APP	+/-
	ICP	+/-
Canada	CCC	+/-
	ACP	-
	APP	+/-
	ICP	+/-
The United Kingdom	CCC	+/-
	ACP	-
	APP	+/-
	ICP	+/-
France	CCC	+/-
	ACP	-
	APP	+/-
	ICP	+/-
Australia	CCC	+/-
	ACP	-
	APP	+/-
	ICP	+/-
Hong Kong	CCC	+/-
	ACP	-
	APP	+/-
	ICP	+/-

Note: (-) and (+/-) signs show a negative and insignificant relationship between WCM and FP (ROA).

Source: Author's calculations

Table 6.8 Summarised Results of CG Components - SGMM Estimation (2008 GFC)

Markets	CG Components	SGMM
The United States	NIDs	+/-
	ACM	+/-
	BAA	-
	EC	+
Canada	NIDs	+/-
	ACM	+/-
	BAA	-
	EC	+
The United Kingdom	NIDs	+/-
	ACM	+/-
	BAA	-
	EC	+
France	NIDs	+/-
	ACM	+/-
	BAA	-
	EC	+
Australia	NIDs	+/-
	ACM	+/-
	BAA	-
	EC	+
Hong Kong	NIDs	+/-
	ACM	+/-
	BAA	-
	EC	+

Note: (+) and (-) signs show a positive and negative relationship between CG and FP (ROA). +/- shows no significant relationship.

Source: Author's calculations

6.4 Conclusion and Contributions

Prior studies have examined the individual relationship between WCM, CG and FP. However, the use of WCM components and CG determinants in examining the empirical impact on FP in one single study does not exist. Further, these prior studies were conducted only for specific sectors/industries, and/or for a specific country and also for a shorter time span. Furthermore, prior studies have mostly estimated the relationship using OLS and fixed-effects (see table 3.3 and 3.4) which could be one possible reason for the divergent results (see Tables 6.9 and 6.10). Due to divergent results in prior studies, this study investigates the relationship between WCM, CG and FP using different features, such as a larger data set, a larger time period (10 years) and six markets from developed regions.

In addition to OLS and FE methods, this study also used dynamic panel data (DPD) estimation techniques for measuring the dynamic relationship (Baltagi, 2008). According to Baltagi, the presence of a dynamic relationship indicates that the OLS and FE results in prior studies produced biased and inconsistent results.

Table 6.9 Crux of Relationship between Working Capital Management and Firm Performance

Previous Studies	Market	Period	Size	Relationship
Afrifa (2016)	UK	2004-2013	6926	Positive
Aktas et al. (2015)	USA	1982-2011	15541	Positive
Baños-Caballero et al. (2014)	UK	2001-2007	258	Inverted shaped
Deloof (2003)	Belgium	1992-1996	1009	Negative
Gill et al. (2010)	USA	2005-2007	88	Positive
Juan García-Teruel and Martinez-Solano (2007)	Spain	1996-2002	8872	Negative
Lazaridis and Tryfonidis (2006b)	Greece	2001-2004	131	Positive
Padachi (2006)	Mauritania	1998-2003	58	Negative

Source: Author's compilation

Table 6.10 Crux of Relationship between Corporate Governance and Firm Performance

Previous Studies	Market	Period	Size	Relationship
Basu, Hwang, Mitsudome, and Weintrop (2007)	Japan	1992-1996	174	Negative
Bender (2003)	UK	2001-2002	15	Positive
Conyon (2014)	USA	2008-2015	S&P 500	Positive
DeYoung, Peng, and Yan (2013)	USA	1995-2006	141	Positive
Ghosh (2006)	India	1997-2002	462	Positive
Hubbard and Palia (1995)	USA	1980	147	Positive
Kato and Long (2006)	China	1998-200		Negative
Lausten (2002)	Denmark	1992-1995	243	Negative
Murphy (1985)	USA	1964-1981	73	Positive
Main, Bruce, and Buck (1996)	UK	1981-1989	60	Positive
Parthasarathy, Menon, and Bhattacherjee (2006)	India	2006	237	Positive
Sun, Wei, and Huang (2013)	USA	2000-2006	31	Positive
Zhou (2000)	Canada	1991-1995	755	Positive

Source: Author's compilation

This research has contributed to WCM and CG literature in several ways. First, it adds directly to accounting and finance empirical literature, by explaining the impact of WCM and CG on FP. Second, most of the existing studies have confirmed that WCM and CG affect FP, but they

ignored the dynamic relationship between them. This research provides expanded and improved results by investigating and identifying the dynamic relationship between WCM and FP for six developed markets. Therefore, we applied the dynamic panel data estimator to measure the relationship between WCM, CG and FP in the presence of endogeneity. This study provides a breakthrough as this important econometric aspect of endogeneity may be considered in future studies that investigate WCM, CG and FP.

Third, this research provides a basis for results expansion by providing the findings of six developed markets, which differentiates it from previous studies that were based on small data sets. According to Rashid (2018) and Durnev and Kim (2005), prior studies have been industry and country specific, based on small number of firms and for shorter sample periods. According to these authors, expanding the results of prior studies is difficult. Our study provides sufficient basis for the expansion of results based on the findings for six markets from the developed world with large data set for a period of 10 years.

Fourth, this study introduces the FC* term to investigate the impact of WCM and CG on FP during the 2008 GFC. To date, no study has collectively examined the impact of WCM and CG on FP during the 2008 GFC. In terms of the WCM components, this study provides consistent results in the case of the 2008 GFC by showing a negative relationship between ACP and FP. However, in the case of CG determinants, BAA is negatively significant and EC is positively significant. This cross-country comparison results among the six developed markets during the 2008 GFC provides a future way forward for other developed markets to address potential financial crises.

Fifth, this study also reports a significant relationship between FP and firm characteristics, such as firm size, sales growth and current ratio. This study reports positive relationship between firm size and FP which means that larger firms have better FP, in comparison to smaller firms, due to the presence of large number of skilled managers, the latest technology and purchasing power to buy materials in bulk. CR also has a positive relationship, which means that higher firm liquidity margins help to achieve better FP. Sales growth has an inverse relationship with FP. Hence, firms need to identify and pay attention to specific firm characteristics to improve FP.

In summary, this study reports that efficient WCM management (all of its components) and good CG practices, leads to improved FP in developed markets.

6.5 Implications of the Study

The awareness for WCM and CG is raised around the world due to several unfortunate events, the collapse of big firms across and the 2008 GFC (Allen, 2005; Claessens & Yurtoglu, 2013; Lins et al., 2017). This study's findings are important for managers, investors, policy makers, academicians and debt holders.

In term of WCM components in developed markets, this study shows that a reduction in the CCC leads towards better FP. It also provides a way forward for the rest of the markets globally, particularly in the developed or western world, to efficiently forecast the future economic conditions in order to prepare for future financial and market crises. This study also supports Enqvist et al. (2014) claim that CCC effects the relationship between WCM and FP. These findings might also be useful for manager to improve FP by reducing the CCC.

Generally, firms sell their products to their clients on credit, which means they collect their receivables in the near future. Although this trade credit is important for firms to retain their customers, keeping in view the firm's liquidity and profitability, receivables needs to be collected at the earliest possible time. Delays in receivables collection effects FP and will increase a firm's debt. This study also found a negative relationship between ACP and FP, which means that a reduction in the period of receivable leads to better FP in all of the six developed markets. The same is also evident from the 2008 GFC results (see Table 5.13). These findings may help debt holders who are considering lending to firms in these markets. As the ACP variable shows, these firms are in strong position and collect their receivables from customers, and therefore would be able to make debt repayments within a shorter time frame.

In terms of APP, the positive relationship for the six chosen markets indicates that firms with higher profitability wait longer to pay back their suppliers and use that money as a source of financing for other investments. The study findings might be useful for credit rating agencies and the banking sector before granting any kind of loan. The study's findings will also help these agencies to assess whether the firms are able to repay the loans. Furthermore, firm managers may use the study findings to devise relevant policies related to suppliers' payment, while considering the effects of delayed payment on FP.

Finally, the negative significant relationship suggests that efficient management of ICP (by reducing the ICP) helps to increase FP. This implies that a shorter period of ICP would help to reduce inventory maintenance costs, such as insurance, rent, perishable items costs and other

costs linked with inventory. Thus, by reducing the inventory maintenance cost net income will increase, which will ultimately help to increase FP. The findings are useful for firm managers. The findings related to WCM components show that WCM has a significant effect on FP. This clearly shows that managers, policy makers and financial management advisors need to pay attention to WCM components in order to improve FP and to avoid any adverse effects on FP.

The other variable of interest in this study is the determinants of CG. Starting with the NID variable, the findings show a negative relationship with FP. The negative relationship implies that fewer number of the independent board of directors will increase FP. The negative significant NID results are in line with Ararat and Yurtoglu (2006) for Turkey; Cavaco et al. (2017) for France and Haldar et al. (2018) for India. This means that less independent directors help to achieve better FP. This is due to two reasons; 1) information deficit and 2) independent director are less informed, as compared to affiliated members. These two reasons are due to a trust gap between NID and internal directors of firm, as the independent directors have linkages with various industries and social connection. Therefore, firms CEO and internal directors are reluctant to share specific information with independent directors. Similarly, in terms of the BAA variable, there was a positive relationship reported with FP. The positive relationship of BAA indicates that the younger the board members are, the better a firm's performance. This is because younger members are more willing to take risks (Horváth & Spirollari, 2012). Finally, EC shows a positive relationship, which means that higher compensation for executives motivate them to achieve better FP. The findings are consistent with Conyon (2014) and Ntim et al. (2015) studies and also in accordance with tournament theory. This theory states that high compensation will motivate managers to perform at their best, in order to gain promotions and to reach the top-level management (Burns et al., 2017; Eriksson, 1999; Ridge et al., 2015). Top management and owners might find this helpful in motivating their staff. The findings in term of CG determinants clearly show that to achieve better FP, in the selected developed markets, CG practices need to be implemented in their firms. Hence firm managers and policy makers should consider CG components when formulating their policies to achieve FP.

The collective impact of WCM and CG on FP endorses the results of WCM and CG with FP on an individual basis. Hence, this study indicates that both WCM and CG should be considered in parallel when making any kind of financial decisions, as ignoring one of them may reduce

their effectiveness in improving FP. The findings of the collective relationship can also be used by academics in future when examining the impact on FP. Furthermore, by focusing on both WCM and CG components, firms would be able to develop a strong business framework. This will enable them to develop specific policies in light of their suppliers, customers and investors, which will, in turn, reduce the risk of failure.

Senior management are more interested in achieving short-term FP, rather than long-term FP (O'Regan & Ghobadian, 2004). But investors today are interested in long-term performance. Although short-term performance helps a firm to avoid bankruptcy, the measurement of both short-term and long-term performance is important to examine a firm's financial health and performance (O'Regan & Ghobadian, 2004). While WCM effects the short-term FP (Talonpoika et al., 2016), CG effects long-term FP. Therefore, the findings of the collective impact of WCM and CG on FP may be used by future investors and financial management consultants, to provide an effective performance measurement system for individual firms, in light of both short-term and long-term performance indicators.

This study also shows that the WCM, CG and FP relationship is dynamic in nature. The relationship between WCM, CG and FP suffers from an endogeneity problem, as evident from dynamic OLS (see section 5.2.2.1) and the Wooldridge Test for Strict Exogeneity (2002) (see section 5.2.2.2). Hence, dynamic panel GMM was used to address the endogeneity problem and provide efficient and unbiased results. This finding enables policy makers to acknowledge the relationship between WCM, CG and FP is not unidirectional but a two-way relationship (see section 5.2). This means that WCM and CG affects the FP, but also that FP also affects WCM and CG.

Finally, the relationship between WCM, CG and FP during the 2008 GFC shows that to attain better FP and to handle any kind of financial crisis, firms should have an efficient management for WC components and good CG practices. These findings may be helpful for regulators and governments when dealing with financial crises.

6.6 Limitations

In ideal conditions, all related variables and factors may be considered, but in reality, it is not possible to consider all factors while executing research. As discussed in Chapter 3, the study limitations include data collection, and the proxies used to measure FP. Although some of

these limitations have the ability to affect the results, this effect is not strong enough to invalidate the results of this study or to affect the interpretation of the results.

This study has considered many factors while investigating the empirical relationship between WCM, CG and FP, but it has some limitations. First, this research is based on a sample of only publicly listed firms which have already been scrutinised in order to meet shareholders' expectations. Hence, readers are cautioned against using these results for non-listed firms. Listed and non-listed firms behave differently due to various distinct characteristics and features. For example, listed firms have easier access to finance as compared to non-listed firms. Most of the non-listed firms operate on the basis of owner investment.

Second, the sample is only for six developed markets and the results should be carefully interpreted for other markets, especially for emerging and frontier markets. These emerging and frontier markets have different country specific factors, such as CG rules and regulations, levels of economic development and different tax systems. It would be interesting to determine the effects of WCM and CG in other markets, such as emerging and frontier markets, to compare the findings of this study. Furthermore, the study time period of 10 years is too large, compared to other prior related studies. A larger time period, though, enables researchers to capture major changes during that time period. However, the disadvantage is that it reduces the data set due to non-availability of data for many firms. Many firms are delisted or merged with other firms during the longer study time period.

Third, this study uses the data from the *Bloomberg* database, which has been used by many prior studies. Although this database is reliable and authentic, in case of CG some variables have missing data which may be available on other specific CG related databases, such as Compustat and Thomson Reuters.

Fourth, this study is based purely on quantitative methodology when investigating the relationship between WCM, CG and FP. The qualitative factors have been ignored in this study. This has been discussed further in the future research directions section below.

Furthermore, this research relied on ROA, ROE and TQ's as indicators to measure FP. These indicators have more desirable distributional properties and are commonly used while measuring FP. However, researchers have used other proxies, such as net profit margin, gross operating income, return on investment, and return on invested capital. This shows that FP

can be measured using various proxies. Therefore, the results of this study should be interpreted with caution.

Finally, FS, CR, and SG have been used as control variables in this study. Future studies may like to explore the interest rate, GDP growth and industry averages as control variables when investigating the WCM, CG and FP relationship.

6.7 Future Research Directions

First, as noted above, the findings of this study are based solely on empirical models. Researchers may like to explore the qualitative relationship between WCM, CG components and FP. Future research may also explore optimal ways for managing WCM and CG components in an efficient manner.

Second, the literature reveals that FP is mediated through different factors, such as tops management behaviour, their knowledge and external environment factors, such as the bargaining power of suppliers, the bargaining power of customers, economic conditions of the market and industrial structure (Dess & Davis, 1984; Filbeck & Krueger, 2005; Porter, 1980; Wilson, 2008). Hence, future research may explore the impact of these mediating factors on WCM and CG, as it will help policy makers to align WCM and CG strategies and might produce significant outcomes that will help increase FP.

Third, in terms of empirical analysis, we also suggest investigating the dynamic relationship of other markets across the globe. This would not only validate the results of this study but also enable the generalisability of dynamic panel data estimation results. GMM addresses econometric problems, such as endogeneity and serial correlation, but the methods has some limitations as well. It is considered to be an internally generated instrument, which may weaken with the number of lags increased. Therefore, future research might consider the use of 2SLS as an alternate. However, this would be subject to the availability of strict exogenous instruments.

Fourth, future research could investigate the impact of WCM and CG on the FP of private firms to see if the results differ from publicly listed firms.

Fifth, FP is also affected by other control variables which have not been included in this study, such the interest rate, GDP growth, leverage and industry averages. These control variables may also be studied in future. Finally, the growth role or role of macroeconomic conditions

may be investigated to test their impact on the relationship between WCM, CG and FP. This study provides some future research directions, which as a result, will further enhance our understanding of these important issues.

Appendix A

Table A-1 Wooldridge Results for Autocorrelation

Markets	ROA	ROE	TQ
The United States	22.459* (0.0000)	19.701* (0.0000)	10.119* (0.0016)
Canada	45.187* (0.0000)	54.481* (0.0000)	23.520* (0.0000)
The United Kingdom	4.579* (0.0034)	50.009* (0.0000)	8.554* (0.0041)
France	6.259* (0.0015)	0.089 (0.7666)	25.058* (0.0000)
Australia	1.303 (0.2617)	2.059 (0.1604)	28.472* (0.0000)
Hong Kong	7.053* (0.0088)	6.422* (0.0012)	14.706* (0.0002)

Note: The table presents the p-value of Wooldridge test for autocorrelation in parenthesis. * indicates significance at the 1% level.

Source: Author's calculations

Appendix B

Table b - 1 Diagnositics Test With TQ

	Model 1						Model 2					
Markets	**AR (1)**	**AR (2)**	**Hansen. J.O. ld**	**Hansen. J. Diff**	**No. INST**	**Obs.**	**AR (1)**	**AR (2)**	**Hansen. J.O. ld**	**Hansen. J. Diff**	**No. INST**	**Obs.**
United States	0.003	0.783	0.115	0.738	127	1031	0.000	0.653	0.451	0.112	127	2376
Canada	0.004	0.379	0.521	0.874	119	451	0.010	0.055	0.925	0.697	105	316
United Kingdom	0.000	0.520	0.093	0.618	127	1142	0.015	0.600	0.600	0.134	127	679
France	0.000	0.065	0.433	0.541	127	370	0.005	0.110	0.451	0.333	127	305
Australia	0.001	0.460	0.526	0.666	115	497	0.029	0.213	0.546	0.555	96	170
Hong Kong	0.195	0.315	0.709	0.773	121	708	0.000	0.642	0.894	0.110	119	664

Note: AR (1) shows values for the first order test for autocorrelation, AR (2) is the test for second-order autocorrelation, Hansen. J.O. ld is Hansen test for over identification and Hansen. J. Diff is the difference test for exogeneity. No. INST and No. Groups are the number of instruments and number of groups, respectively. Control variables, year dummies and industries dummies are also included.

Source: Author's calculations

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